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BRIEFLY TOLD.

THE MAJORITY WILL AGREE WITH THIS.—The following letter from Mr. W. A. Aldrich, of Spokane, Wash., does not need any explanation:

To the Editors AMERICAN GAS LIGHT JOURNAL: As a member of the American Gas Light Association I desire to offer a few remarks on that part of President Miller's address (made at the Detroit meeting), pertaining to the gas arc, and his conclusions thereon.

Whatever the Committee on President's Address may have reported respecting such part of the address as relates to "gas arcs," his findings will be read and received by most gas men with feelings of profound astonishment and surprise. For many years we have been watching, praying and working that a lamp might be invented and placed on the market which would successfully compete with the electric arc for store lighting; and now that we have the lamp and have proven it the greatest competitor the electric arc ever contended with, we are told by the President of the largest and most influential Gas Association in the country that we are making a grave mistake in pushing the sales of gas arcs; that the practice is bad from almost every point of view; that they are not satisfactory or economical, and that it is better to lose customers than to encourage the use of these lamps, which—he further says—"In the long run cannot fail to hurt the gas business."

The writer ventures the suggestion that President Miller stands nearly alone in his remarkable contention. If the gas arc is a failure in New York, the eminent ex-Chief Engineer of the New Amsterdam Gas Company must seek further before condemning the arc generally.

What the gas arc—*properly installed, properly maintained*—has done to enable the writer to compete successfully with cheap electric light has been done by hundreds of gas managers elsewhere. If the advent of the gas arc in the East has been the cause of chandeliers being removed from the residences on Fifth avenue, then do I agree and sympathize with the gentleman; but, as far as store lighting is concerned, his contention is diametrically opposite to the experience and results obtained wherever gas arcs have been installed. The gentleman further stated that "One mantle of the group may be used, or all may be used together, but no *intermediate* number may be kept lighted at one time; therefore, they are not convenient." Let us see! Can an electric arc be subdivided? The answer is, "No!" The present up-to-date gas arcs, by an ingenious, yet simple, contrivance are fitted with a by-pass light, allowing one mantle to be used, giving about 100-candle power, or all of them. This by-pass light, if allowed to burn all night, not only advertises the store, but has a very deterrent effect on would-be burglars, and at a cost of about half a cent per hour. Is an electric arc absolutely steady, or are its oscillations and changes in color very detrimental to the eyes of those compelled to work in proximity to it? This query also must be answered in the negative; but not one of these objections may be suggested where the gas arc is used. It yields an absolutely steady, mellow light; filling a store with an appearance of life and effect, while an electric arc is ghastly, unpleasant and injurious to the eyes. To suggest chandeliers in stores in this survival-of-the-fittest age is like taking us back to the dark days when the electric arc threatened to send most of us to the bankruptcy courts, which, thanks to Dr. Auer von Welsbach, is not yet. I imagine that in some of the

LIBRARY OF CONGRESS. NOV 30 1903 SMITHSONIAN DEPOSIT.

mammoth stores in New York, if gas chandeliers were used, it would be necessary to commence lighti ng up when the stores opened in order to have them lighted by the time for closing them was at hand.

In conclusion, all this and much more has been obviated by the advent of the gas arc, the inventor of which deserves a place high on the roll of honor of every Gas Association in the land. Much more could be said on the subject (the writer has not touched on the comparative cost, candle power, etc., as agai nst the electric arc), but I have trespassed too much on your valuable space. Much more could have been said; but scarcely less. Yours, very truly, W. A. ALDRICH.

KEEP UP THE GOOD WORK.—Elsewhere (p. 845) in this issue will be found the text of two circulars of inquiry, put out by Mr. Frederick H. Shelton, President of the Western Gas Association, which inquiries have to do with matters of general interest to gas men. The circulars, with the explanatory memorandum of Mr. Shelton, require no further elucidation respecting their purpose; but it might here be in order to say that, while President Shelton has heard from a number of gas men in reply to the circular letters, as he is anxious to secure the fullest information possible, he will gladly welcome word from those who have not yet replied, or from those who first learn of the circulars and their import from this reprinting.

NOTES—

ON January 1st the Memphis (Tenn.) Gas Light Company will reduce its rate for gas sold on illuminating account to $1 per 1,000 cubic feet.

MR. JUDAH P. GRAY has been appointed Superintendent of the Homer and Cortland (N. Y.) Gas Company, vice Mr. C. W. Barker, resigned.

THE Coast Gas Company, of Belmar, N. J., has been authorized to furnish a gas supply to the sacred groves of the Ocean Grove (N. J.) Association.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

Things Are Not Always What They Seem.

WASHINGTON SAVINGS BANK BUILDING,
WASHINGTON, D. C., Nov. 24th, 1903.

To the Editors AMERICAN GAS LIGHT JOURNAL: Thank you for saying in a foot note to my communication of the 14th inst. (page 802, JOURNAL, 16th inst), "that he [Mr. Egner] seems to forget that low candle power water gas can be easily made." As the originator of two successful systems of making water gas, one in which anthracite coal or coke and oil are the materials, while in the other gas coal could be used, and as the inventor of a third, *in which any kind* of gas yielding material (see AMERICAN GAS LIGHT JOURNAL, January 23d, 1899), could be used to best advantage, it, of course, only "seemed" I had forgotten the excellent attribute of any good water gas apparatus—viz., that it is always in the power of the skilled gas maker io produce carburetted water gas of any desired candle power at a few minutes' notice with it. No; Mr. Egner had *not* forgotten at all; but he was and still is surprised that so accomplished and eminent a water gas engineer as Mr. Arthur Graham Glasgow is acknowledged to be, should still take so much trouble to boost a no longer useful or necessary practice as is the making of high candle power water or any other gas. Very respectfully, F. EGNER.

Manufacture of Mixed Gases.

The *Journal of Gas Lighting* "notes" that the Société pour l'Exploitation des Procédés de Production de Gaz Industrielle have taken out a patent for a process for the manufacture of mixed gases of various calorific powers. The coal is distilled till the greater part of the gases has been given off, and half finished coke is left behind. This coke is then transferred to water gas retorts, and converted into water gas by any of the usual processes. The gases thus produced can be mixed in any desired proportion. The process offers special advantages if the water gas is led into the retorts during distillation, as it then sweeps out all the hydrocarbons before they undergo decomposition—formation of graphite being thus prevented. In the water gas retorts it is advantageous to blow in the steam at the top, withdrawing the gases at the bottom of the charge; any hydrocarbons still remaining in the half finished coke being thus extracted. Should it be desired to reduce the calorific power of the gas, it is mixed with the carbon dioxide obtained in the Dellwik-Fleischer process; any carbon monoxide still left in this gas being utilized.

[ABSTRACT.]

PROCEEDINGS, THIRTY-FIRST ANNUAL MEETING, AMERICAN GAS LIGHT ASSOCIATION.

HELD IN DETROIT, MICH., OCTOBER 21, 22 AND 23, 1903.

FIRST DAY—MORNING SESSION.

The meeting was called to order, in Masonic Temple, at 10 A.M. of the 21st prox., by the President, Mr. Alten S. Miller, of Baltimore, Md. Mr. A. E. Forstall, of Montclair, N. J., occupied the post of Secretary. The President introduced the Hon. William C. Maybury, Mayor of the city, who welcomed the Association to Detroit in hearty fashion. In his

ADDRESS OF WELCOME

the Mayor, amongst other things, said: To progress is the purpose of your presence here this morning. If the final development of everything connected with your business—the manufacture and distribution of gas and its use for light, fuel and power—were reached there would be no necessity for your coming here; but you are conscious that there is a future for this great product as well as there has been a past—a future of light and warmth and of discovery. You are here to see what new steps you may make into the mysterious and limitless beyond, and where is hidden that which may revolutionize your present practices. Since that is what caused you to come here, that is also why we doubly welcome you to our city, for the results of such deliberations must be a benefit to all. (Applause.)

The President having acknowledged the graciousness of the Mayor's welcome, called upon Mr. E. G. Cowdery, of St. Louis, to make formal

RESPONSE ON BEHALF OF THE ASSOCIATION,

who spoke as follows: Mr. President, the Mayor and Members: On behalf of the Association, I desire to thank the Mayor for his kind words respecting our industry and ourselves. As a resident for a great number of years of the rival city of Milwaukee, it has been my pleasure to visit Detroit at not infrequent intervals, and I have been surprised in all my visits, and particularly surprised at this time—and I wish to congratulate Mayor Maybury and the citizens thereon—at the very great progress made and making in the development and growth of their city. I certainly hope the good work will be kept up. (Applause.)

On motion of Mr. E. G. Pratt, the reading of the minutes of the last meeting was dispensed with.

The President called for the

REPORT OF THE COUNCIL REGARDING MEMBERSHIPS,

which was as follows:

Your Council have approved the following applications for membership[1] and submit them to you with the recommendation that they receive favorable action:

Active.

Allyn, G. E., Providence, R. I.	*Grover, T. F., Fond du Lac, Wis.
Bailey, W. Frank, Wilmington, Del.	Healy, W. M., Fort Dodge, Ia.
*Baldwin, W. S., Detroit, Mich.	Hill, S., Seattle, Wash.
Ball, J., Philadelphia, Pa.	*Hurlburt, A., Philadelphia, Pa.
Barclay, V. B., Newport News, Va.	*Irwin, C. H., Long Branch, N. J.
*Bertrand, P. A., Springfield, Mo.	*Jelliffe, C. N., N. Y. City.
Bradley, S., Atlantic City, N. J.	*Kidner, R. W., London, Ont.
Brainard, Don C., Carthage, Mo.	Leland, G. B., Norwich, Conn.
Braine, J. H., Newark, N. J.	Maloney, A. P., Philadelphia, Pa.
*Bryant, C. F., Bridgeport, Conn.	Marple, W. M., Scranton, Pa.
Bunker, T., Camden, N. J.	*Merritt, W. H., Lebanon, Pa.
Butler, M. W., Philadelphia, Pa.	*Miller, T. D., New Orleans, La.
Byrne, E. J., Brooklyn, N. Y.	Miller, W. B., Augusta, Ga.
Clark, J. C. D., St. Louis, Mo.	*Moore, A. W., Woodstock, Can.
*Coate, P. S., Ontario, Can.	Norland, M. A., Chicago, Ills.
*Combs, R. B., Philadelphia, Pa.	Oill, G. L., St. Thomas, Ont.
Copley, I. C., Aurora, Ills.	*Palmer, L. T., Tonawanda, N. Y.
Cresson, B. F., Easton, Pa.	Patterson, H. S., Jersey City, N. J.
*Crowell. F. B., Atlanta, Ga.	*Pease, A. C., Yonkers, N. Y.
Curtis, G. W., Camden, N. J.	*Powell, H. H., Woodstock, Can.
Davidson, R. A., Newburg, N. Y.	Putnam, W. R., Red Wing, Minn.
Davies, G., White Plains, N. Y.	Royce, F. P., Boston, Mass.
Doig, G. I., Gainesville, Fla.	Schenck, R., Chicago, Ills.
Dougherty, D. J., Jacksonville, Fla.	Scott, C. L., Philadelphia, Pa.
*Ellis, J. W., Woonsocket, R. I.	Scranton, G. H., Derby, Conn.
*Engel, F., Elizabeth, N. J.	Shepherd, H. L., Dover, N. H.
Ferris, H. H., Hoboken, N. J.	Simpson, C. C., New York City.
Flick, W. J., Bethlehem, Pa.	Stephenson, W., South Amboy, N. J.
Fox, C. S., Long Island City, N. Y.	Tenney, C. H., Boston, Mass.
Geist, C. H., Chicago, Ills.	*Tompkins, J. P., Atlantic City, N.J.
Gilkyson, J. R., Camden, N. J.	von Maur, J. D., St. Louis, Mo.
*Gould, V. K., Bangor, Me.	*Walker, W. L., Fitchburg, Mass.

1. An asterisk denotes that the party so designated was present at the meeting.

*Wallace, R. A., Hamilton, Can.
Weaver, R. S., Port Jervis, N. Y.
Whitaker, J. S., Portsmouth, N.H.
White, E. C., Long Branch, N. J.
Whitson, J. G., Watsonville, Cal.
*Wilson, W. A., Portage, Wis.
*Wolff, S. E., Jackson, Mich.

Associate.

Brownell, E. E., Dayton, O.
*Case, C. A., Chicago, Ills.
*Cheesman, F. P., N. Y. City.
*Collins, W., Stamford, Conn.
*Cox, E. L., N. Y. City.
*Cruse, A. R., Philadelphia, Pa.
*Garrison, J. J., Detroit, Mich.
Granger, W. R., Montreal, Can.
*Kellum, B. J., Chicago, Ills.
Lindsay, C. R., Chicago, Ills.
*McNary, J. B., Windsor, Can.
*Mason, S., Philadelphia, Pa.
Nicoll, J. F., Otto, Pa.
*Parker, G. W., N. Y. City.
Pattison, M., Cleveland, O.
*Rancke, L. N., Baltimore, Md.
*Schumacher, G., N. Y. city.
Warren, H. J., Stamford, Conn.
Wilkin, J. T., Connersville, Ind.
Zwisler, A. L., Kalamazoo, Mich.

Junior.

Allison, W. A., Philadelphia, Pa.
Bucher, P., White Plains, N. Y.
*Burnett, F., Toronto, Can.
Butler, J. F., Ardmore, Pa.
Cadwallader, L.L., Philadelphia, Pa.
*Calkins, W. B., St. Louis, Mo.
Castor, W. A., Frankford, Pa.
Christy, H. B., Philadelphia, Pa.
Dunne, P., Philadelphia, Pa.
Fitzpatrick, D., St. Augustine, Fla.
Forbes, W., Chattanooga, Tenn.
Fowler, J. W., Jacksonville, Fla.
Frick, J. A., Philadelphia, Pa.
Fulweiler, W. H., Kansas City, Mo.
Gillingham, H.D., Philadelphia, Pa.
Graham, L. C., Philadelphia, Pa.
Green, A., Philadelphia, Pa.
Hammond, E.W., Delaware Co., Pa.
Johnston, E., St. Augustine, Fla.
Kellogg, R. M., Yonkers, N. Y.
Keppleman, J. E., Philadelphia, Pa.
Laubenstein, A. R., Philadelphia, Pa.
Lucena, J., Philadelphia, Pa.
Macbeth, G. T., Yonkers, N. Y.
Morgan, J. E., Mount Vernon, N.Y.
Myler, J. A., Jr., Mamaroneck, N.Y.
Parker, J. C., Philadelphia, Pa.
Parker, J. S., Philadelphia, Pa.
Price, W. H., Kent County, R. I.
Roberts, F. M., Portchester, N. Y.
Schauer, F. F., Philadelphia, Pa.
*Skinner, S., Montreal, Can.
Terry, H.W., Jr., Mount Vernon, N.Y.
Tinsman, E. H., Philadelphia, Pa.
Umstead, E. S., Philadelphia, Pa.
Williams, T. G., Philadelphia, Pa.

Transfer from Associate to Active.

Summey, D. L., Waterbury, Conn.
Vincent, G. I., Philadelphia, Pa.
Walter, E. P., Germantown, Pa.

When the report came up for discussion the name of Mr. Sidney Mason, and his right to membership under certain conditions, were debated. Mr. Walton Clark, of Philadelphia, who had indorsed Mr. Mason's application for full membership, was inclined to withdraw the nomination after an explanation by the President, which amounted to the statement that Mr. Mason could do as he liked about taking what he could get, since he could not have what he asked for; the name was allowed to stand. The Secretary stated his intention to explain the matter to Mr. Clark. In announcing his intention, the Secretary stated, "for the benefit of Mr. Clark," that he would explain to Mr. Mason why he was elected an Associate without consulting him or his indorsers. The Secretary also said he would inform Mr. Mason that he was at perfect liberty to accept the election as an Associate or not, as he liked.

Mr. T. O. Horton (New York city) then moved that the Secretary cast the official ballot for the members recommended This was carried, and after Mr. Irvin Butterworth and Mr. K. N. Mitchell had been appointed tellers, the Secretary was directed to cast the usual ballot, and the tellers reported the affirmative vote. The President then welcomed such of the members as were present on the floor.

Next in order was the

GENERAL REPORT OF THE COUNCIL,

which was as follows:

DETROIT, MICH., Oct. 21, 1903.

The American Gas Light Association: Your Council has the honor to make its annual report as follows: A separate report upon applications for membership recommends the election of 127 applicants. The resignations of six active and one associate members have been received and accepted during the year.

The following list of papers has been approved to be read at this meeting:

"Our Correspondence School," by Alex. C. Humphreys, New York City.

"The Policy of Gas Enrichment (Illustrated by London Practice)," by Arthur G. Glasgow, London, England.

"Some Features of Municipal Ownership," by Henry L. Doherty, New York City.

"Notes on the Operation of Large Carburetted Water Gas Sets," by W. C. Morris, Long Island City, New York.

The Council has been successful in making arrangements for a lecture on the subject of "Gas Engines," to be delivered before the Association the morning of Thursday, October 22d, by Prof. Alfred H. White, of the University of Michigan.

The Council recommends that the subscription of the Association to the Educational Fund be renewed for a further period of five years, for the same annual amount—$250.

The movement toward a gas exhibit at the Louisiana Purchase Exposition, having been brought to the attention of the Council, it recommends to the members of the Association that they give it their hearty co-operation and that they contribute, each to the extent of his ability, to the success of the exhibit.

During the year the report of the Committee on Uniform System of Accounts for Gas Companies, as presented and accepted at the last meeting, has been published and issued to all the members of the Association. The Council has voted that extra copies of this report may be purchased by members of the Association at a price of $5 per copy, and copies will be sold to non-members of the Association at a price of $10 per copy. It has also voted that as long as the supply lasts each new member elected will have the privilege of purchasing a single copy at the price of $2, any extra copies desired to be at the regular price of $5 per copy.

Respectfully submitted,

ALFRED E. FORSTALL, Secretary. ALTEN S. MILLER, President.

On motion of Mr. Rollin Norris the report and its recommendations were received and adopted.

A SPEECH FROM MR. F. H. SHELTON.

The President then stated that Mr. Fred. H. Shelton had requested the privileges of the floor for a short time to present a matter to the Association. The minutes do not show that the President invited Mr. Shelton to take the floor, but rather that Mr. S., taking all that he wished to have as his for granted, took the floor and proceeded to explain that he had asked for the privilege of the floor in connection with the report of the Council in the matter of the St. Louis Exposition. He urged that the matter should be pushed by every member to his best. Mr. Shelton said that it was a matter of common knowledge that no exhibit of gas using apparatus worthy of the name had ever been made at any American Exposition, and he strongly urged that a creditable exhibit should be made in 1904, and that the opportunity should be used to show types of gas apparatus both present and past. It was stated that the Western Gas Association had taken the initiative, and that the opportunity was unique. That "more or less power to act" had been delegated to the speaker, and that he had already made arrangements which insured a splendid opportunity. In regard to funds Mr. Shelton said he thought there would be no difficulty, and that which mainly was demanded by the circumstances was a determined effort to make the exhibit a pronounced success. Mr. Shelton then sketched the plan of the proposed exhibition of gas appliances. It was proposed to classify the exhibits thus: 1. Samples and models to show the state of the art, gas works machinery, scrubbers, condensers, purifiers, water gas apparatus, coal gas apparatus and other special appliances. 2. Distribution methods and appliances; to include various sorts of lamps and the like. "We are expecting to get the best groups and collection of gas consuming appliances ever assembled in this country," said Mr. S., and he added it should not only have great educational influence on the public but also be of great use to the gas men. The plan also proposed an historical exhibit of the machinery of the past, specially old specimens, to show the development of the art. Mr. Shelton said he hoped that every member would do all he could to make the exhibit all it should be by loaning and by persuading his neighbor to lend also. Special stress was laid on the fact that there was nothing sectional or local in the action of the Western Association, which had acted simply by chance, the matter having been brought up in its meeting before it was brought up at any other, and he asked for the aid and co-operation of all. No further action was taken at this time, but the applause that followed Mr. Shelton's speech showed that the members were in accord with his ideas.

THE REPORT OF THE SECRETARY AND TREASURER

next occupied attention.

In introducing his report the Secretary explained that the showing of a deficit of $426 was caused by the printing and distribution of the Report of the Committee on Uniform Accounts, the cost of which was $1,800. If there had been no unusual expense the report would have shown a balance of $1,400, nearly, as an excess of income over expenditure.

	3d Sec.	4th Sec.	5th Sec.	Sec of 1906.	Special Class 4th.	5th.	6th.	Total.
Members enrolled Oct. 1, 1902.	16	24	43	..	1	3	..	89
Entered Class, Jan. 1, 1903..	..	4	..	81	..	..	4	89
Additions to Class since Jan. 1, 1903.....	..	1	3	21	..	1	1	27
	16	29	46	102	1	6	5	205
Resigned during year.....	3	3	1	5	..	..	..	12
Dropped for non-receipt of answers during year	2	10	26	37	1	5	..	81
Finished course April 1, 1903.	11	..	..	..	..	..	..	11
	16	13	27	42	1	5	..	104
Total enrollment, Sept. 30, 1903.....	..	16	19	60	..	1	5	101

	Fifth Section.	Section of 1907.	Total.
Applications on file for admission to class Jan. 1, 1904...	1	14	15

Names of students who completed the three years' course, April 1, 1903.

Berkley, J. M., Findlay, O.
Butler, M. W., Philadelphia, Pa.
Kersting, A. F., Pittsfield, Mass.
Klein, A. W., Atlanta, Ga.
Norris, J. S. Montreal, Can.
Sellen, E., Montreal, Can.
Sherwood, E. J., Madison, Wis.
Sites, W. M , Denver, Col.
Stannard, C. N., Denver, Col.
Walker, W. L., Fitchburg, Mass.
Wood, W. M., Philadelphia, Pa.

In addition to these P. N. Gibbons, Philadelphia, Pa., and Wm. H. Miller, Bangor, Pa., answered all except the last two sets of questions.

On motion of Mr. E. G. Pratt, the reports were accepted.

The President then called for the

REPORT OF TRUSTEES OF THE GAS EDUCATIONAL FUND.

Before making it the Secretary submitted his usual formal protest, reminding the members that the report was read simply as a courtesy, the Trustees of the Educational Fund not being a committee of the Association, nor responsible to it, but "An entirely separate and distinct body, which was organized by the Association on a self continuing basis."

To the American Gas Light Association and Subscribers: The Trustees appointed at the Twenty-sixth annual meeting of the Association, held October 17th, 1898, to administer the Educational Fund formed by your subscriptions, submit the following report as to the work done from October 1, 1902, to September 30th, 1903.

We are compelled to record with great sorrow our first loss by death, that of Eugene Vanderpool.

One of the original Permanent Trustees, Mr. Vanderpool was elected Treasurer when the Board organized and remained in that position until his death, July 12th, 1903. Having received a technical education, a rare thing among the men who entered the gas business in the late sixties and early seventies, he appreciated fully the advantages to be derived by the gas industry from the work of the Board and was earnest in attention to his duties as a member and an officer. His large experience and sound judgment in engineering and financial matters rendered his counsel valuable and made his loss a severe one. Not content with doing what he could while living, he had given instructions that after his death his valuable gas library should be given to the Board and this has since been done. This bequest still further increases the debt owed him by everyone interested in our work. At a meeting held July 22d, the following minute was adopted:

"Eugene Vanderpool, member and Treasurer of this Board from its foundation, died July 12th, 1903. By Mr. Vanderpool's death this Board loses an interested, efficient and conscientious officer and member. To the knowledge that his judgement, founded on inherent good sense and tempered by experience in positions of responsibility in engineering and financial institutions, was influencing the actions of this Board, has been due, in large measure, the confidence of the gas profession in our undertaking.

"This Board will miss the wise counsel of its late member, and the Trustees mourn the loss of a man whose personal qualities made association with him a privilege and a pleasure.

"The Trustees, desiring to place on record their appreciation of his service, their feeling of personal sorrow and loss by his death, and their sympathy with his family in this bereavement, have ordered that this minute be spread upon the records and that a copy be sent to his family and published in the AMERICAN GAS LIGHT JOURNAL and 'Progressive Age.'"

Mr. William R. Beal has been elected Treasurer to fill the vacancy.

As the period for which the original subscriptions were made expired October 1, 1903, it was necessary to secure new subscriptions in order to carry on work. With this object in view there was sent to each subscriber whose subscription had expired, a letter setting forth the work that had been done and the results that had been obtained during the five years and requesting, on the basis of these results, a renewal of the subscription for another term of five years. A similar letter was sent out later to all the gas companies in the United States and Canada and to all the members of the American Gas Light Association who were not already subscribers. As a result of these letters, copies of which are appended, subscriptions have been received to an amount which will just enable the work to be carried on, along the present lines, for five years more. The expenses are, however, even at present practically equal to the income and additional subscriptions are necessary to make it possible to take care of more students or to increase in other ways the value of the work. It is, therefore, to be hoped that all the old subscribers who have not yet renewed their subscriptions will do so and that many more new subscriptions will be made. Should the income exceed the expense the surplus will be turned in to the permanent fund which it is desired to bring up to such an amount that the interest upon it will meet all expenses and thus do away with the necessity for further subscriptions.

The work of the Correspondence Class has been carried on throughout the year. The members of the third section having finished the three years' course, their connection with the class ceased on April 1, 1903. The Section of 1906 started work January 2, 1903, with a membership of 81.

At the urgent request of one of the subscribers to the fund a change has been made in the rules governing eligibility in the class, by which membership instead of being restricted to employees of gas companies is open also to employees of companies engaged in the manufacture of apparatus and appliances employed for the manufacture, distribution and consumption of illuminating gas.

The number of members in each section at the beginning of the year and the changes that have taken place during the year are shown in detail on the Secretary's report, which is appended. The fourth section now contains sixteen members, the fifth section nineteen, and the section of 1906, sixty making the total membership in the regular class ninety-five. One special student who is receiving the questions and answers with the fifth section and five special students are receiving the questions and answers with the section of 1906.

The card index of gas periodicals, which has been one of the lines of work carried on by the Trustees, now covers all the principal articles published in the AMERICAN GAS LIGHT JOURNAL, "Progressive Age" and the "Journal of Gas Lighting" since 1894. It is kept up to date, each number of these periodicals being gone over as it is received and the necessary cards made out and filed. The value of this index to any person wishing to read upon any subject connected with the gas industry will be readily appreciated.

The Treasurer's report, which is appended, shows the total amount of subscriptions to date, the available income and expenses for the year, a summary of the cash account and a statement of the amount of the surplus fund and the securities in which it has been invested.

The surplus fund is made up of portions of subscriptions paid in in advance of the time when they are due, of unexpended balances and of interest received on investment. The proper portion of the advance subscriptions will, of course, be drawn out each year to meet expenses, but the unexpended balances and the interest will accumulate into a fund which will be available to assist in carrying on the work in case all the present subscriptions are not renewed when they expired.

Respectfully submitted,
Trustees Gas Educational Fund,

ALFRED E. FORSTALL, Secretary. WALTON CLARK, Chairman.

TREASURER'S REPORT FOR YEAR ENDING SEPTEMBER 30, 1903.

Condition of Original Subscriptions.

		Per Year.
Total amount of subscriptions October 1, 1902. ...	$21,119.20	$4,212.84
New subscriptions received during year.....	462.90	92.58
Total to September 30, 1903.....	$21,582.10	$4,305.42
Of these subscriptions there have been paid and used during the five year period.....	21,016.90	
Leaving still in force.....	$565.20	

New subscriptions have been made for five years to amount of	.....	
Received from subscribers during year.....	4,165.90	
Payments not applicable to year.....	516.32	
Total paid in by subscribers available for year....	3,649.58	
Paid in previous to current year on account of 1902-3 subscriptions.....	655.84	
Total subscriptions available for year.....		$4,305.42
Dues received from membership in special class.....		30.00
Sale of six sets of questions and answers for one year.....		30.00
Total amount available for year.....		$4,365.42

Statement of Income and Expense for Year.

Total amount available for year		$4,365.42
Expenses.		
Secretary's salary.....	$3,000.00	
Office rent.....	300.00	
Furniture (filing cases and basket)..	13.10	
Printing, stationery, postage, etc.....	604.42	
Cuts for illustrating answers..... ..	44.26	
Total expenses paid to Oct. 1, 1903.....	$3,961.78	
Add for expenses incurred but unpaid, printing, stationery, postage, etc..	$43.75	
Total expenses for year.....		$4,005.53
Balance.....		$359.89

Cash Account for Year.

Receipts.		
Received from subscribers during year.....	$4,165.90	
Interest for 1 year on $2,000 Binghamton Gas Works 1st mortgage 5 per cent. bonds.....	100,00	
Interest for 1 year on $1,500 Atchison, Topeka & Santa Fe Railroad, general mortgage 4 per cent. bonds.	60.00	
Interest for 6 months on $1,000 Omaha Gas Company 1st consolidated mortgage 5 per cent. bonds.	25.00	
Sale of 6 complete sets of questions and answers for 1 year.....	30.00	
Dues received for Membership in Special Class.....	30.00	
Total receipts for year.....	$4,410 90	
Cash balance from last year.....	299.38	
Total to account for.....		$4,710.28
Expenditures.		
Expenses for year paid.....	$3,961.78	
Expenses left unpaid from previous year.....	240.41	
		4,202.19
Balance....		$508.09
Balance in National Newark Banking Company as per Pass Book less unpaid checks..		508.09

Surplus Fund and Investments.

Amounts paid in advance.....		$679.20
Unexpended balance from 1898-1899.....		1,330.99
" " " 1899-1900.....		397.70
" " " 1900-1901.....		343.71
" " " 1901-1902..		211.88
Interest on bonds to date.....		584.72
Total.....		$3,548.20
Already Invested.		
$2,000 Binghamton Gas Works, 1st mortgage 5 per cent. bonds	$1,930.00	
$1,500 Atchison, Topeka & Santa Fe R. R. general mortgage 4 per cent. bonds...	1,513.75	
		$3,443.75

Also $1,000 Omaha Gas Company, 1st mortgage 5 per cent. bonds given by Mr. Clark in renewal of his subscription.

Notwithstanding the Secretary's explanatory process the President treated this report as that of a committee of the Association, and Mr. C. H. Graf moved that the report "be accepted and inserted in the Proceedings," and that the questions and answers sent to the Class be printed with it, which motion was seconded and carried.

(To be Continued.)

[OFFICIAL.]

Two Noteworthy Circular Inquiries.

OFFICE OF PRESIDENT, WESTERN GAS ASSOCIATION,
15th and Chestnut Sts., Philadelphia, Pa.,
November 23, 1903.

To the Members, Western Gas Association—Gentlemen: I have sent to every gas company circulars, copies of which are appended. To these I have received so many replies that it is impossible at present for me to acknowlrdge them all. Answers that have been kindly sent are numbered in the hundreds. I wish to take this means of expressing my appreciation sent in response to the circulars of inquiry, and to express the grateful appreciation of the Western Gas Association for the mass of information that has been so co operatively tendered. The work involved in the two matters in question becomes a pleasure, with such kind co-operation from the many gas companies responding, and I personally thank each one as well. Yours truly,

F. H. SHELTON.

[CIRCULAR NO. I.]

PHILADELPHIA, PA., Nov. 9, 1903.

Gentlemen: At the last meeting of the Western Gas Association there was considerable discussion upon the subject of asphyxiation from the inhaling of gas and the best methods for the treatment of such cases. The Association determined to investigate the matter at some length and to formulate, if possible, some recognized and authoritative directions for the treatment of asphyxiation cases, with the idea that it could, as a result, shortly and appropriately issue to all of its members—and with its compliments to other gas men—better information and more convenient instructions on this subject than have heretofore been available. *I would appreciate very much your kindly advising me of the methods you use locally for reviving those who may have been asphyxiated from illuminating gas.*

Practice and customs differ widely in different places. If I can secure information as to the various methods used, it will be possible to judge as to which of them is most effective and to be desired, and to make a practical report to the Association as above.

In answering I will be glad to have you go as fully into the subject as you can, and would ask you to also kindly state whether coal gas or water gas is made at your works, and also the approximate number of asphyxiation cases in the past 10 years in your city.

Yours truly, F. H. SHELTON,
President.

[CIRCULAR NO. II.]

PHILADELPHIA, PA., NOV. 9, 1903.

Gentlemen: It is generally recognized that one of the most important questions in the management of a gas property is that of cordial relations between the company and its employees.

To the end of increasing good feeling and the income of the men, and of decreasing the likelihood of strikes or other trouble, there have been from time to time a number of efforts made in the direction of *profit-sharing schemes*, or *co-operative*, or *mutual benefit associations*.

I have the honor of serving as President of the Western Gas Association for the current year, and in the usual address to be made at the next meeting, I desire to dwell especially upon the labor question, and the success or otherwise of profit-sharing plans. To the end that I may cover the subject as fully as possible, I am very desirous of learning what has so far been done in the above direction in this country by gas companies, and I would like to ask you whether at any time your company has tried such plan?

I would appreciate very much indeed your writing me briefly whether any profit-sharing, bonus for good record, co-operative mutual benefit, or other plan has been tried between your company and your employees, and if so, on what basis as to principal points, and with what success?

If such arrangements exist with you at present I would much appreciate copies of any agreements, by-laws, or other papers that the company or the men use in such connection. I would like also to know whether the men in your works are "union" men, so called, or not; whether you have ever had a strike, and if so, a brief statement of its features, cause, and results; and what your general system is for meet-

ing complaints from the men; for promoting the worthy ones and extending them pleasures, or points of benefit on the part of the company?

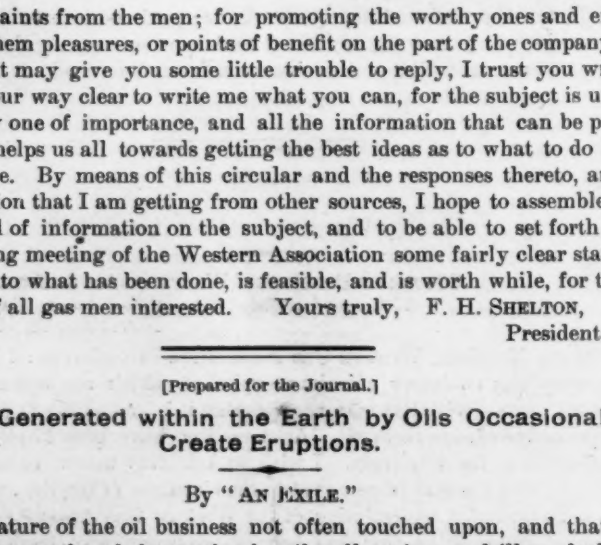
While it may give you some little trouble to reply, I trust you will yet see your way clear to write me what you can, for the subject is undoubtedly one of importance, and all the information that can be put together helps us all towards getting the best ideas as to what to do in the future. By means of this circular and the responses thereto, and information that I am getting from other sources, I hope to assemble a good deal of information on the subject, and to be able to set forth at the coming meeting of the Western Association some fairly clear statements as to what has been done, is feasible, and is worth while, for the benefit of all gas men interested. Yours truly, F. H. SHELTON,
President.

[Prepared for the Journal.]

Gases Generated within the Earth by Oils Occasionally Create Eruptions.

By "AN EXILE."

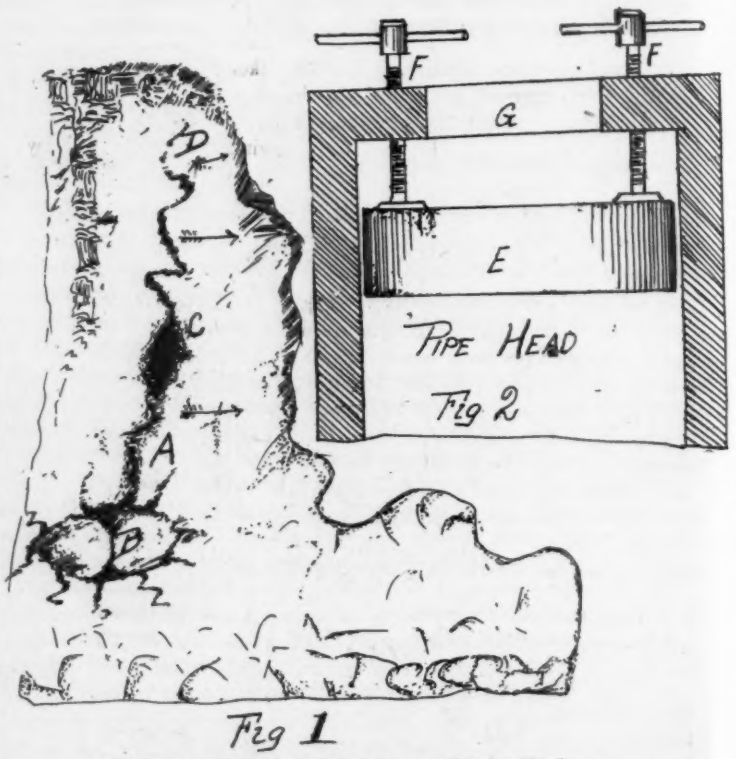
One feature of the oil business not often touched upon, and that is something worthy of observation by oil well engineers, drillers, dealers and handlers of illuminating and lubricating oils of the class secured from the deposits in the earth, is that which now and then shakes the earth, and known to the public in general as earthquakes. Your correspondent who has been travelling in the earthquake regions of the islands of the southern seas, where the earth is shaken very severely several times a year, has had an opportunity to examine into and investigate the causes and conditions of earthquakes as due to generated gases of oils. The scientists have long since outlined the whys and the wherefores of the shaking of the earth in proximity to volcanoes; but the trembling of the earth in the vicinity of the oil depositories beneath its crust appears to be something out of the ordinary. Taking the great oil region of Baku, Russia, for example, we find that the earthy strata is always very unstable and that the shifting, sliding and breaking up of the surface deposits is by no means infrequent. The experts inform me that this is due to two reasons. First, the generation of gases constantly going on from the oils causes these oil gases to try to escape some way, whence partition or dividing walls are often broken in. When this occurs on a large scale, the stratas of earth are seriously broken up, and the earth oftentimes receives a shock. The collecting of gases in crevices often develops shocks by suddenly expanding, or escaping, or igniting and blowing open parts of the earth. The other cause is due to the extraction of oil. This fact is best demonstrated in connection with low grade oils as burned in lamps. If the lamps are permitted to burn low, and only a little oil remains in the oil reservoir, certain atoms of air mingle with the oil forming an explosive mixture which has oftentimes caused the lamp reservoir to break and serious results follow. Engineers who have operated the cylinders of gasoline engines understand this fully. The mixture of air and oil in the cylinders creates a very explosive compound. The theory is, therefore, that the extraction of oil from the cavities in portions of the earth permits air to enter and, mingling with the oils, develops an explosive compound which, when it explodes, causes an earthquake.



Strong Spanish Building to Resist Earthquakes.

Some Instances Related.—I will refer to some actual occurrences which came to my observation. In the first illustration a cross-sectional view is shown of a territory infested with petroliferous strata. The situation is that of a hill-side. The chamber of oil deposits is at *B*, while the oil, in its mechanical working operation to seek surface, forces a channel through the crevices as outlined at *A*, *C* and *D*. As time passes (perhaps years), the chambers form and gases generate. Bye-and-bye something arises to ignite the oils, and the exploding gases of course force out the wall of earth and it falls to the valley below. The sensation to anyone in the immediate vicinity is an earthquake effect, or the oils may develop gases which cannot escape and, for lack of vent holes, the expansion alone pushes the wall of earth outward. Or, perhaps, the oils ooze off gradually, until but little remain, and then the airs get a chance to impregnate and mix with the oil and the combination makes an explosive mixture that is capable of shocking the earth when it explodes.

All workmen about oil wells are familiar with the struggles experienced in checking oil gases when drilling and tapping new jets. Sometimes the jets are of great force, especially when the oil chambers are smashed in by explosive cartridges. The headpiece for checking the outpour of oil is often very powerful, as represented in Fig. 2. The



Showing How Oil Gases Generate and Develop Shocks.

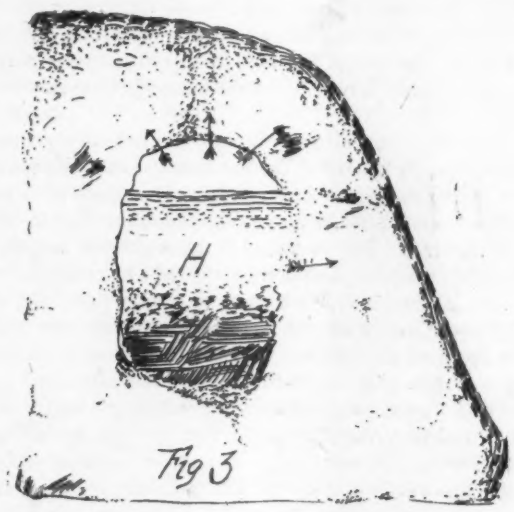
pipe sides are made solid, with the shouldered outlet at top at *G*. The arrangement is for a disk, *E*, to be drawn up securely, slowly and steadily, by the spiral screws *F*, *F*, until this disk caps the hole *G*, and

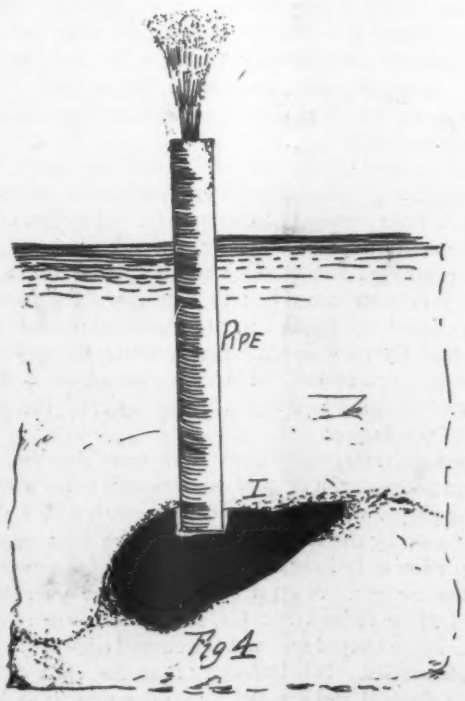
View in the Oil Districts of China.

then interior pressure of gases or oils merely serves to close the opening tighter.

We next refer the reader to the sketch in Fig. 3. Here there is a cavity shown in the earth, some distance beneath the surface level, of the depository order. This type of chamber or reservoir usually forms as a result of years of action of the oils and gases, which action tends to wear away, absorb and reduce the earth's composition at this point, resulting in the formation of an open place or cavity of the kind shown. Often these cavities are of considerable proportions. Sometimes the crust above the reservoir is so light that a loaded team passing over the crust creates a trembling condition. A hollow sound is produced when the crust is struck with a heavy device. The layers of liquid compositions in chambers in the earth of this order vary. The letter *H* designates the middle of the interior composition. Sometimes shale, oil slush, clay puddlings containing oily stuffs, petroleum and the like are found in the mixture. Then, again, there are considerable volumes of gases generated, and the extent of these gases determines the character of the shock imparted to the earth, if any shock is imparted at all, when the gases explode or expand. Oil well drillers have often tapped these reservoirs of years of standing and succeeded in obtaining natural gases which burn for considerable time. If the strata of the earth's composition is fairly well compacted the escape of the volatile matter is reduced to small proportions and the gases accumulate. If the strata is of a loose and open-fissure composition the likelihood is that the bulk of the gas will pass off into the atmosphere.

The plan of tapping these chambers in the earth in which gases have accumulated in years is interesting to engineers. Fig. 4 is drawn up





Oil and Air Mixtures Often Create Explosions and Miniature Earthquakes.

for the purpose of illustrating the process of adjusting the tube which taps the gas well. The engineers, upon discovering indications of confined gases, usually take measures to secure these gases, and if possible run the gases by pipe lines to commercial centers. Other processes consist in the packing of the gases in tanks and metal cylinders for transportation, but this method is not very general. The procedure involves the sinking of a shaft to the point where the gases are collected. As soon as the drills touch the reservoir, volumes of gas appear through the opening, and in the event of sparks being in the vicinity an explosion may occur. With proper precautions an explosion is avoided,

After an Explosion in Moro Land.

and the shaft is employed for receiving the tube as shown. The tube or pipe is extended in sections to the depository, *I*. The gas jets immediately pass upwards through this outlet and are collected through a pipe system for commercial service. No doubt earthquakes have been averted in oil sections oftentimes by the engineers tapping and so allowing these confined gases in due season to escape.

Commercial Value of Benzol.

In a recent issue of the *Iron and Coal Trades Review*, England, a writer deals with the subject of the residuals produced in the carbonization of gas coal and the important part they have played in lowering the price of gas. He points out how one of these residuals—tar—has increased in usefulness in the course of years; further discoveries having led to the production from it of various colors and antiseptics, and an extensive group of solvents, varnishes, timber preservatives, lubricants, and fuels, all of which are obtained by inexpensive processes, and are cheaply produced in consequence of the large quantity of tar put upon the market. The author quotes from the paper read by Mr. H. E. Jones early in 1901 before the Institution of Civil Engineers, to show the average yield of a ton of Durham gas coal; and it is there seen that the amount of tar is 10 gallons, or 113 pounds, which, on the 13 million tons of coal carbonized in 1899, means a production of more than 700,000 tons. One of the substances resulting from the distillation of tar is benzol, upon the commercial value of which the author makes some remarks which are worth reproduction.

He begins by calling attention to the fact that, though commercial benzol is now an industry of importance, it was not until 1856 that Hoffman's discovery, made eleven years previously, of the existence of benzol in the distillates of coal tar became of value, owing to the discovery in that year by Perkin of the first aniline dye stuff. At that time, it was the practice in England to obtain the light tar oils, and to distil them fractionally; and when England, with her highly developed gas industry, had the lead in this matter, up to the middle of the eighties, the names of the various qualities became fixed in this country. Now, 90, 50, 30 and 0 per cent. benzols, respectively give off 90, 50, 30 and 0 per cent. of their volume up to 212° E., and, in any case, give 90 per cent. below 248°. The last of these will accordingly give 90 per cent. between 220° and 248° F., and consists mostly of toluol.

Going into history, the author says that, according to a recent article in *Die Chemische Industrie*, it was M. Collas, of Paris, who first put pure benzol, etc., on the market; but this was done at very high prices. The demand caused new sources of supply to be sought for; and in 1873, Pelouze and Audouin scrubbed the tar vapors out of coal gas, and Caro, Clemms and Engelhorn washed them out with oil in 1869. This was, however, found to be to the detriment of the lighting power of the gas. In the eighties, the recovery of tar, ammonia and gas from blast furnaces came in. The tar was poor in benzol, but the gas contained a good deal of it. In 1884, Carvès took out his English patent (No. 15,920); and in 1887, Brunck and Hussener put the process into a prac-

tical form, and introduced it in Germany. In a short time, this source of supply became a very extensive one; and consequently the various attempts to produce benzol by superheating brown coal oil and petroleum residues came to nothing, and were abandoned. All that remains of them is the extraction of benzol from oil gas tar, and from the liquid deposit produced upon the compression of oil gas.

The increasing supply told upon the prices. In 1882, benzol cost, per 2 cwt., from 175s. to 400s.; in 1885, from 50s. to 90s.; in 1890, from 100s. to 125s.; in 1892, from 40s. to 60s.; in 1895, from 25s. to 60s.; in 1896, from 50s. to 120s.; and in 1897, 1898, 1899 and 1900, the average prices were 65s., 25s , 20s., and 20s. In 1892, there was a cessation in the erection of new works; and in 1895, a heavy demand indeed. At present, Germany makes about 28,000 tons of benzol per annum, of which about 22,000 tons are employed in dye stuff works, while the rest is used for carburetting, as a solvent, and for motors. The imports into Germany from England and Belgium were, in the years 1891, 1892 and 1895-99, 7,316, 5,683, 8,317, 11,305, 10,135, 5,915 and 5,291 tons; and the exports to these countries, 516, 519, 1,966, 1,539, 1,270, 1,611 and 2,755 tons. In the meantime, all the German chemists paid great attention to questions of boiling point, etc., and the consumers became more stringent in their standards of purity; so that methods of testing had to be considerably elaborated. The boiling point alone was found to be an insufficient test or specification. Disputes arose as to whether "90 per cent. benzol" meant one which gave off at least 90 per cent. at 212° F., or exactly that proportion. Then, further, "90 per cent. benzol" may mean 82 benzol and 18 toluol, 92.2 benzol and 7.8 xylol, 90 benzol *plus* 5 toluol and 5 xylol, or 84 benzol *plus* 13 toluol and 3 xylol. The author says the last of these is about what "90 per cent. benzol" should be. He then goes on to point out that "90 per cent. benzols" may differ very widely from one another; but for practical purposes he thinks it is enough to state also the temperature at which 95 per cent. comes over. A good 90 per cent. benzol should not give more than 93 per cent. at 212° F., and not less than 95 per cent. at 230° F. A good 50 per cent. benzol should give this percentage at 212°, and 90 per cent. at 248°; 0 per cent. benzol. nothing at 212° and 90 per cent. at 248°; pure benzol should give 95 per cent. with a rise in temperature not greater than 33° toluol the same; and xylol should give over nothing below 227°, 90 per cent below 284°. The "30 per cent. benzol" has quite disappeared from the market.

The author concludes by saying that the demand for benzol is so considerable that the over production apprehended when coke ovens began to contribute to the supply has hardly set in; and at present, through strikes and possible shrinkages in the coke industry, it seems conceivable that there may be a shortage. The prices during the past 2 years were, however, not profitable; and many works have therefore given up making benzol. But if there should come a scarcity, he considers it will not be due to this so much as to the steadily increasing demand.

Tin Roof Repairing.

By Mr. N. Resiak, in *Metal Worker*.

Roof repairing is not a pleasant task by any means, and a good mechanic usually dislikes such work. Too frequently, however, this work is intrusted to the poorer class of workmen and to the younger hands, with results that are satisfactory neither to the employer nor to the house owner. Too much of such slighting of work will result in loss of custom, most of which pays better than new work. It will not be denied that job work, roof and gutter repairs included, returns a larger and more certain percentage of profit than contract work, for which perhaps several have competed.

Such custom, then, should be cultivated, and it is not enough merely to advertise "Repairs Carefully and Promptly Done." It is necessary to convince people of that fact by actual experience. The proof of this has been demonstrated many times by such directions as the following: "Now, Mr. Tinner, your competitor, Mr. Roofer, sent two boys up here 2 weeks ago, and although he has sent me a big bill the roof leaks worse than ever." They always say the roof leaks worse, although it would be safe to assume that it doesn't. But let that pass; the real point is to do your work so that it can't leak.

A disagreeable feature of roof repairing, and one which cannot be entirely overcome, is that the orders for such repairs are most plentiful when autumn is changing into winter, and there is little desire for an out-of-door life high up in the air. Moreover, this overplus of repair orders conflicts with other work which is seasonable at this time, such as heater, furnace and steam work. In order that this embarrassment of good fortune may be a little more evenly distributed, a form like that given in Fig. 1 may be printed on postal cards in typewriter style

Jonesville, N. J., Sept. 1, 1903.

Mr. *Wm Jones*

DEAR SIR:—Wet snow and melting ice will find leaks in a roof which is impervious to a shower of rain. It takes longer and costs more to repair roofs and conductors in cold weather than in mild weather. Are YOUR roofs and rain spouts ready for the winter?

A coat of good paint at the proper time will often save the price of a new roof. We employ the BEST MEN and the BEST MATERIALS. Both Phones.

Respectfully yours,

Plumbing, Heating. and Tinning.

J. TINNER & CO., 63 B. St.

Fig. 1.—A Timely Hint.

Emphasis is placed on this style of type, as we believe a plain announcement of this kind is more effective than a display "ad." of the same size. It will be easy to suggest variations from the form presented, such as a letter sheet inclosed in an envelope, with a good wood cut of a scene representing water dripping through a handsomely painted ceiling on to a carpeted floor, etc.

It sometimes happens that a customer insists on knowing the cost of the repairs before the work is begun. The uncertainty of such work requires that an average section, comprising ⅛ or ¼ of the entire roof, be laid off, and this section be carefully gone over, one sheet at a time, and the leaks located plainly with chalk. By counting the leaks thus marked and adding to the number to allow for the portion not marked, a fairly safe basis for calculation may be obtained. A good price for the work should be set, as it is safe to infer that your competitor is not in the game, particularly if he has been ineffective in a former attempt at repairs.

It is poor policy, as well as dishonest, to induce a customer to repair a roof which the judgment of the mechanic would condemn; and if the nature of the leaks is such that a definite guarantee of a useful life for a reasonable time cannot be given, the customer should be plainly informed of that fact. For instance, if the leaks are mainly split seams, caused by the expansion and contraction of the tin, the conclusion is obvious that, although the roof may be made tight for a time, other seams will open and cause new leaks from the same cause. The owner should be apprised of that fact, and the better way is to do so by letter, retaining a carbon copy to guard against future trouble.

A good and trustworthy mechanic should be given full charge of the job, and furnished with sufficient help to run the job along with speed enough to prevent its becoming a distasteful burden. A good plan is to have the best man hunt for and mark all the leaks, taking one sheet at a time in regular courses across the roof; another tinner to repair the leaks, and a boy to prepare them for soldering. It will be found that the best tinner will find the leaks much faster than they can be repaired. Two sets of soldering tools on the roof will, therefore, be necessary. If the boy does the work of preparation well the three will be kept busy, as he will be able to prepare the leaks as fast as two tinners can solder them.

Taking it for granted that the roof is old and protected with several coats of paint, a gasoline blow torch should be used to burn off the paint where it is necessary to scrape for soldering. This makes the work of preparation quick and easy, although the one using the torch should be cautioned not to poke the hot blaze into a hole in the tin. The writer was once compelled to hold down the metal capping of a ridge on a row of fine dwellings, the sparks meanwhile traveling along the tinder like dry rot under the metal, while the boy who caused the mischief went down two sets of ladders after a bucket of water. As the boy was instructed not to hurry while in sight of the servants, nobody else knew of the danger.

To prevent the flame of the torch from scorching the paint on the tin further than necessary, a strip of asbestos cardboard should be cut, with a slot of the proper width, as shown by the cut, with a slot of the proper width, as shown by the cut in Fig. 2, and the heat applied to the unprotected portion only long enough to permit of the easy removal of the paint by the scraper. A good scraper for the purpose may be made from an old 10 or 12-inch flat file, shaped as shown in Fig. 3. Both edges of the spear shaped end and the curved edge of the hoe shaped end should be sharpened. It is important that the ends of the split seam leak be well cleaned and scraped, as carelessness in so doing will result in the entrance of water beneath the new repair.

The method so often followed of piling on solder to cover a leak in a split seam is unsatisfactory in several respects. The leak is likely to

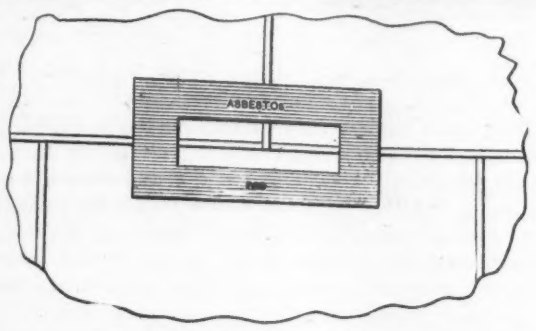


Fig. 2.—A Torch Pad for Paint Burning.

open again through the solder, on account of bubbles blown in by the moisture during the soldering; and if the leaky seam occurs in the gutter the raised ridge of solder holds back the water. Less solder is required and a better repair is made by capping the split seams with strips of good tin cut about ¾ inch wide and slightly bent lengthwise through the middle of the folders, as shown in Fig. 4. The edges of the tin need

Fig. 3.—A Cleaning Scraper.

Fig. 4.—A Seam Cap.

not be nailed down or prepared in any way, except that the strips should not be kept on hand long before they are used, as they solder much better with the edges freshly cut.

A leak caused by a nail head pushing up through the tin should be covered with a cleat nailed down over it with a single nail, as shown in Fig. 5. Where it is necessary to fasten down tin which has bulged up and broken away from its fastenings, screws should be used, with the same kind of cleats.

Where it is necessary to place a large patch, the old tin should be cut away nearly to the size of the new patch and building paper placed under the new tin. The new patch should be blind nailed and soldered carefully. For a reasonably flat roof the ordinary method of blind nailing is to turn up the edges of the patch on all sides, nailing through the tin just inside the turned up edge and battering down the turned up edges so as to cover the nail heads, as shown in Fig. 6.

Fig. 5.—A Nail Cap.

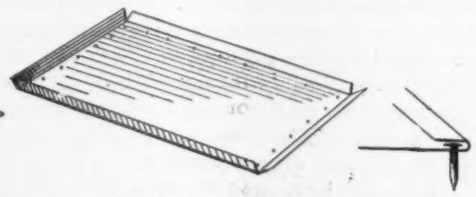


Fig. 6.—Fastening Down a Patch.

For a long patch near the edge of a roof, where a good appearance is an object, or on a steep roof, the upper side of the patch may be blind nailed so that the edge presents the same appearance as a lock seam, as shown in Fig. 7.

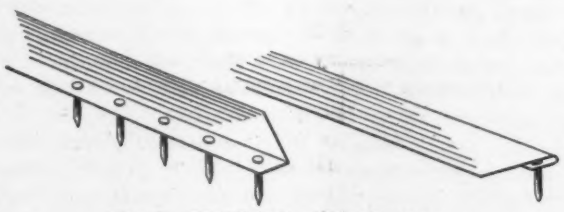


Fig. 7.—Blind Nailed and Edge Patches.

After the marked leaks have been repaired it is well to give the roof another close examination, remembering that the customer pays for the time, while, if called back to repair a forgotten leak, there is likely to be a dispute as to who should pay for the extra time, with the added humiliation of "taking two bites at a cherry." When the repairs are satisfactorily completed the acid may be washed from the places repaired and the patches painted.

In conclusion, the writer would say that it is not a fool's job to locate the leaks in a tin roof, and combinations of timbers, boarding and roofing paper are sometimes found which will tax the ingenuity of a smart man. The place where the water enters through the ceiling may be, and often is, at some distance from the actual leak in the roof. When a troublesome leak cannot be located by the ordinary method of measuring above and below, the tinner is justified in cutting up the tin at the suspected spot, when an examination of the under side of the tin may reveal the trouble in numerous small pin holes, or at least lead to a search in the proper direction.

I have gone through the mill until able to guarantee a roof that I have repaired will not leak within a reasonable time. Although I do not now repair roofs, I have not lost my interest in the subject, and am occasionally called upon to ferret out baffling leaks. An interesting chapter might be written by almost any roof repair man on peculiar leaks. I was called upon to locate a leak some time ago where two stories intervened between the ceiling where the leak showed and the roof. A quantity of fine cutlery was injured by it. There was a steam radiator directly over the goods damaged, but the family renting the flat stoutly insisted that the air valve had not been touched, and pointed to the dust on the floor as an evidence of the truth of their statement. The dust certainly did look natural, but after a search, which covered every possible source of trouble from roof or cornice, we cut up the floor and found the plastering, joists and even the under side of the flooring thoroughly soaked with water from the radiator. While all roof leaks cannot be attributed to radiators, here is evidence that the roofer may be called upon to discover the cause of water damage or have his reputation and the roof suffer by imputation.

Employers' Liberality.[1]

In view of the extremely unsatisfactory character of the laws of the several States relative to the liability of employers for accidents to workmen and the difficulty experienced in the courts of doing substantial justice to all in interest, the State of Massachusetts has done wisely in referring this subject to a special commission to study it broadly and report a bill which shall meet the requirements of the case fairly and with intelligent regard to modern industrial conditions. This promises a much better result than could be expected from the passage of such haphazard bills as may be introduced by members who act on their own initiative or at the suggestion of labor leaders. The Massachusetts commission has concluded its labors, so far as hearing testimony is concerned, and is now engaged in preparing its report, which it is required to present before the close of the present year. It will undoubtedly be a document of great interest and value. The inquiry has been exhaustive, and if the result of the commission's work is up to the standard of most of the Massachusetts State documents it will have permanent value as a contribution to industrial literature.

The existing law of Massachusetts relating to employers' liability is, in operation, unsatisfactory to all in interest. Under it the workman cannot recover damages for injuries resulting from his own negligence or that of a fellow workman. On the other hand, the employer is required to provide safe and suitable ways, works and machinery. He must advise the workman of dangers which exist when these are not so obvious that failure to see them is *prima facie* evidence of contributory negligence on his part. This seems simple and, at first glance, equitable. That it is not so in practice is due to the fact that it is usually impossible to establish by testimony that an employer who is conscientious and tries to do his duty has done all that is possible to protect his workmen and warn them of other than obvious dangers. Many machines and many processes of manufacture are essentially dangerous, and safety for the workman demands the exercise of a greater and more constant vigilance than he is likely to exercise for his own protection. No employer of labor can so equip his plant as to make its dangerous machinery or apparatus "fool proof." He cannot so fence it in and guard it with shields and fenders that the man or boy who is indifferent to danger and who prefers to do things in the easiest way cannot cut or maim or kill himself. Indeed, experience in a great many instances has shown that the greater number and ingenuity of the safeguards provided the greater the propensity of the workman to disregard ordinary prudence, and to rely less upon his own vigilance than upon that of his employer. This invites accident.

Experience has also shown that when an observance of the precautions of safety involves trouble, the average workman will deliberately choose the risks of neglecting them. Two cases in point will illustrate this. A manufacturer conducting a forging operation under very rapid hammer blows found that his workmen experienced great trouble from getting sparks in their eyes. He accordingly provided very light spectacles inclosing large disks of very thin white mica, which neither magnified nor in way embarrassed or obstructed the vision.

They perfectly accomplish the purpose for which they were designed, but after one day not a man in the shop would wear them, preferring to

1. *Iron Age.*

take the risk of hot sparks in the eyes, with the result that one or two suffered from this distressing accident daily. In another shop in which non-carburetted water gas was used as a fuel in a metallurgical operation requiring high temperature, it had been found dangerous to go above the mill floor when the fires were running. Many of those who had occasion to do so were overcome by the carbon monoxide in the atmosphere and fell from the ladders to the cement floor, suffering more or less serious injury. Strong belts of webbing were accordingly provided, having iron rings to which ropes were attached, and instructions were posted all over the place to the effect that, owing to the danger of the gas under the roof, workmen and millwrights were forbidden to go above the mill floor for any purpose without putting on a belt, throwing the free end of the rope over a truss chord and calling another man to hold it, so that if the climber was overcome with dizziness or lost consciousness he might be lowered to the floor safely and without broken bones. This rule was persistently disregarded until enforced by the threat of instant and unconditional dismissal for all who failed to obey it. These instances are typical.

Experience has further shown that the transference of liability by the employer to a corporation under a policy of accident liability insurance does not meet all the requirements of the case. The damages awarded a workman for injuries received, and to his heirs in the event of death, are often far in excess of the amount for which an insurance company becomes liable in any individual case. This difference must be made up, and often represents an impairment of capital, since it is an indeterminate risk for which no provision can be made in the charge of the manufacturer for his product. It is often impossible for the insurer to comply with the conditions of his policy, and by reason of this inability he is frequently unable to hold the insurance company for damages even to the limit of the contract stipulations. He faces momentarily the risk of crippling and perhaps ruinous loss, which cannot be averaged and provided for.

The grievance of the workman growing out of the present system is partly real and partly sentimental. In many instances he has to do with machines which are dangerous if not handled in exactly the right way. Whether it is possible for a man engaged in a monotonous task to keep his mind so fixed upon his work and his vigilance at such tension that every motion is just what it should be is a question somewhat too involved with psychological phenomena to admit of this brief discussion. As a matter of fact we often find that a man who has run a cutting machine or a circular saw or other highly dangerous tool for years without accident, suddenly loses his fingers or his hand. He may not know why this happened. If he does, he will probably realize that it is because he did something which he knew was wrong, and cannot imagine why he did it. Perhaps he thinks that he should not be expected to keep his wits about him when engaged hour after hour in a monotonous task, which leaves his mind free to go out wool gathering, and perhaps he is right. But to what extent is the employer responsible for the fact that while running a machine which he knew to be dangerous the workman did not pay attention to what he was doing and was hurt? Machinery sometimes breaks. The obligation of the employer is to provide good machinery and to make sure, as far as he is able, that everything is as strong as it should be.

But he cannot discover the flaw in the casting, and if he buys the best, what more can be expected of him? Nothing, perhaps; but the workman who is scalded with steam or crushed under a detached mass of iron or otherwise injured in his service finds it hard to believe that the employer did all that could reasonably be expected of him. He feels that he is the victim of a system which has sacrificed him to the profits of the business in which he is engaged. Perhaps he is right; but how shall the responsibility for this condition be fixed? Juries are proverbially sympathetic, and in awarding him compensation for his injuries may do great injustice to the one who must satisfy the judgment. It is a large and anxious problem.

The report and recommendations of the Massachusetts commission should have as much value as interest for all concerned. The loss of life or productive power as the result of industrial casualities is a fact which cannot be disregarded. It falls upon someone—if not upon the employer, then upon the community—for the man who cannot support himself must in one way or another be supported. Even when the workman is barred by his own evident negligence from going to a jury with a plea for compensation, or the employer is held blameless, the loss has been incurred and must be met somehow. The State of Massachusetts has pursued the right method in amending its laws respecting employers' liability, and if the results are disappointing, it will doubtless be because the solution of the problem involved cannot be found through seeking, but must be evolved with the progress of civilization.

The Choice of Wattmeters.

[By Mr. Paul MacGahan, in *Elec. World.*]

Much has recently been written concerning the increased amount of revenue obtained by companies supplying electricity to the public, owing to the adoption of the more modern and accurate wattmeters that have lately become available. Cases have been cited of lighting companies being remunerated for from 40 per cent. to 65 per cent. of the total power generated, thus obtaining a sufficient increase over former revenue to convert their stock from a doubtful investment to one paying excellent dividends.

This has opened the eyes of progressive station managers to the progress of events, and most of them have already abandoned the wattmeters in vogue 5 or 10 years ago, replacing them by the newer types. To those who have not yet decided which of the modern wattmeters to adopt, or who have reason to believe that they have decided wrongly, the following notes regarding comparative features may be of interest:

It is well known that the most important reasons why the total power delivered to the consumer is not paid for are, first, that at light loads the old types of wattmeters run entirely too slow or actually not at all; and, second, that these same meters run too slow at all loads owing to increased friction from wear. It is very seldom that a meter is found running faster after any considerable period of service, as such a condition can only be due to an aging of the permanent magnets, and in the present state of the art of making magnets the aging, if any, is very slight.

Many wattmeters are loaded the greater portion of the time to only 10 per cent. to 20 per cent. of their normal capacity, and it is evident that an error under such conditions may become a very serious thing, yet none of the old style wattmeters, after a month or two of such service, could show an error less than 10 per cent. to 25 per cent. at light loads.

The sale of alternating current for power purposes has brought about problems of correct registration at low power factors, and with varying frequencies, wave forms, voltages, loads and temperatures. Each of these causes produces its own error, and all added together give the maximum error in registration. When it is stated that a wattmeter is accurate within 2 per cent., it is meant that all these causes, each of a magnitude such as would be found in actual operation, and all acting in unison, produce a resultant error not exceeding 2 per cent.

The ideal wattmeter, to meet the requirements of the station manager, should sustain the highest possible initial accuracy over its whole range during its term of service. It should also be dust, water and insect proof, and so constructed as to make tampering impossible.

To obviate the latter contingency, there should, of course, be provision for the electric light company's seal. It would also be a great advantage if the wattmeter is sold, sealed by the manufacturer, so that in case of a dispute with a customer, his seal and guarantee could be referred to as proof of calibration by a responsible and disinterested party. Moreover, a manufacturer cannot in self protection guarantee a wattmeter not sealed by himself, and therefore cannot be expected to make repairs without charge, as it would be impossible to detect any change in adjustment after leaving his hands. It is evident, therefore, that an unsealed wattmeter is unguaranteed.

The only excuse for a manufacturer supplying unsealed wattmeters is in cases where their moving element is so heavy that the jewel bearings would not stand the rough handling due to shipment, and have to be inserted after the wattmeter is in place. It should be understood, of course, that the manufacturer's seal does not prevent the purchaser from repairing his own wattmeters if he so desires.

In testing a wattmeter for initial accuracy, observations should be made at the extreme variations of voltage, frequency, power factor and temperature likely to be met with in the electric light company's distributing system. Curves should be plotted under each condition for various loads from $\frac{1}{10}$ to $1\frac{1}{2}$ times full load. It is very important to see that the meter will not creep on shunt current alone, or that at least it should not from this cause make a full revolution of the disk; half a revolution of creeping is unimportant, as it may be due to a mechanical unbalancing of the disk.

Care should be taken also that the measuring apparatus used should be suited to the capacity of the wattmeter under test. Thus it would be quite absurd to test a 5-amp., 100-volt wattmeter down to 50 watts or less, using a 1,500-watt indicating instrument for a standard as the latter cannot be read with sufficient accuracy on less than 200 watts. It should not be forgotten that an integrating wattmeter has a range of legibility several times as great as that of any indicating instrument now on the market. Therefore, when indicating wattmeters are used

as standards, about three instruments of different capacities should be used for testing an integrating wattmeter at different loads.

Overload capacity is an important consideration in the selection of a wattmeter. It permits the use of a smaller meter, thus increasing the accuracy of registration at light loads and decreasing the cost of the meter equipment. Thus, when a house having an installation of 20 100-volt lamps is to be metered, a 5-amp. wattmeter having reasonable overload capacity is entirely sufficient, for generally only 5 to 10 lamps will be burning at one time. The meter should be able to carry a load of 15 lamps (7½ amp.) continuously with accurate registration, and 20 lamps (10 amp.) for a short period without danger of injury.

It would necessitate a long running test extending over several months upon many wattmeters of different makes to obtain an actual experimental comparison of the light load permanency of any one of them, but fortunately this quality can be judged accurately at the start by giving attention to the following considerations:

The moving element being supported on a delicate jewel, and driving a train of gears, friction of the jewels and gears is inevitable, and is generally compensated for at calibration. This friction is a variable quantity and is dependent upon the wear. Therefore, as the wear increases, the wattmeter will gradually fall behind, as the initial friction compensation remains constant. It is hardly necessary to consider the friction of the recording train, as the speed of the wearing surfaces is exceedingly small, and the torque overcoming the friction is comparatively enormous, due to the multiplication or leverage of the gears. Thus when the torque at the disk is 1 cm.-gm, the torque at the first dial would be from 1,000 to 10,000 cm.-gm, and 10 times more at each succeeding dial. As a matter of fact, when a wattmeter having a properly designed and constructed recording mechanism is stripped of its gear train, the most delicate tests fail to measure any diminution in the friction.

Thus the all-important consideration is the weight on the jewel bearing and its effect on the accuracy of the recording mechanism. In the case of the ordinary cup jewel and pivot, the amount of weight supported by the bearing is of the utmost consequence. The greater the weight of the moving element, the more rapid the wearing of the jewel and pivot, and the greater the danger of cracking or otherwise damaging the jewel by jarring during or after shipment. Thus, for instance, the weight upon the jewel is doubled; trouble therefrom is enormously increased.

It should be remembered in this connection that watches are not made accurate by powerful springs, giving strong driving power or torque, but by careful jeweling and light moving parts, and that, from the similarity of mechanism, the same principle would hold true for wattmeters. Light weight of moving element should, therefore, be of primary importance. It is also desirable as an adjunct of this light weight, that the driving power or "torque" of the meter should be a maximum. The greater the torque the smaller will be the effect of friction upon speed. For example, a wattmeter with full-load torque of 10 cm.-gm. and uncompensated friction of 1 per cent., or .1 cm.-gm., will require 1 per cent. of full load current to start; and as the friction is approximately a constant quantity at all loads, the meter will record 50 per cent. slow at 2 per cent. load, 25 per cent. slow at 4 per cent. load, etc. If the torque should be increased to 20 cm.-gm. at full load, without an increase of friction, the meter starting with ½ per cent. load will record 25 per cent. slow at 2 per cent. load, 12 per cent. slow at 4 per cent. load, etc.

There are two methods of obtaining a high torque in the induction wattmeter, the first and easiest being by increasing the amount of metal in the disk, thus reducing its resistance and increasing the induced current. But by this means the weight and torque increase together and no advantage is gained, as the ratio of torque to weight remains the same, and the friction effects and jewel troubles increase enormously. The second and correct method is to increase the electrical efficiency of the motor element driving the disk.

It must be borne in mind, therefore, that a high torque, which has been shown to be a desirable element in a wattmeter, may be present solely on account of the heavy moving parts which have been shown to be objectionable. It is only by keeping the moving parts as light as possible and the torque relatively high that the best results are obtained.

THE residents of Senator Depew's church place (Peekskill, N. Y.), are wanting cheaper gas. They are getting it now at $1.60 per 1,000, or $1.50 net. The gas is of good quality and the supply is up to every demand. Let them hark back to 1893 when the late Mr. Sutton was in command. Give some people much and they want more.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, Nov. 10th., 1903.

The Work of the Sulphate of Ammonia Committee.—Differential Prices—with a Big D.—The Junior Gas Associations.

The principal outlet for sulphate of ammonia as manufactured by gas companies is its utilization as a manure. There are a few limited requirements, such as for chemical manufacturers, and for rendering materials fireproof, but they are scarcely of sufficient importance to be worth considering. It is sufficient for the present purpose to say that sulphate of ammonia is a nitrogenous manure and the valuable element is the 19 per cent. or so of nitrogen which it contains. As such it has to compete with nitrate of soda, and some time ago it was observed that its rival seemed to have a knack of being uppermost. Nitrate of soda can only boast of about 16 per cent. of nitrogen, and yet it was realizing almost as good prices as sulphate of ammonia. One reason of this was observed to be that while it was nobody's business to advertise the good qualities of sulphate, a strong committee were taking care of the interests of nitrate. On the principle, I suppose, of "What is sauce for the goose is sauce for the gander," it was thought that tactics which had substantially assisted nitrate, might be adopted with advantage in the case of sulphate. And so the sulphate of ammonia committee was formed at the instance of some of the largest makers, and supported by a levy of a small sum per ton of sulphate made per annum. This was some 6 years ago, and the labors of the committee have been so successful that it is now supported by a large majority of the makers, and represents a large fraction of the total manufacture. The committee is not a ring. It does not deal in corners and options. It simply aims at advertising in various ways, not only directly or by means of pamphlets, but by offering prizes for essays on the value of sulphate, or for exhibits at agricultural shows. Members are entitled to a supply of literature suitable for distribution amongst customers and to a weekly report of the prices at the different ports, and anyone making say 100 tons a year and upwards, who cannot get back the small amount paid as a levy, with the addition of a good fat interest, by the aid of the last named information, is remarkably deficient as regards the superior order of business ability that is the usual characteristic of the British gas engineer. The management of the committee includes gentlemen who understand the ways of agriculturists, which gas engineers and other outsiders, as a rule, do not. And the line they adopt appears to be simple, plain business statements, devoid of elaborate science or other detail. For those who wish to go deeper into the matter, there is a prize essay by Prof. Muir, extending over some 76 8vo. pages, and a pamphlet about double that length by Prof. Warington. As with all other forms of advertising, it is difficult to determine the exact value of the return secured. Certainly the market for sulphate has improved from the miserably depressed condition occupied a few years ago. How much of this improvement is due to the exertions of the committee, and how much to other causes, is largely a matter of opinion. But looking at the matter in a plain business sense, there can be no doubt as to the need for a sulphate of ammonia committee, and that the same is deserving of support and countenance from every maker of the article. As an example of the work done in connection with exhibitions, reference may be made to the brewers' exhibition held annually in London. The committee offer three prizes of £25, £15 and £10 respectively for the best samples of barley grown by the aid of sulphate. These prizes were distributed in Sussex, Devon and Norfolk, and thus afford a widespread advertisement of the value of sulphate. The best result was a production of 10 pecks barley per acre.

Thé question of differential *versus* uniform rates is nearly obsolete now, but those who impugned the commercial honesty—and they were not a few—of a 10 per cent. rebate on stove and engine consumption, must stand aghast at the methods adopted by electricity suppliers who appear to favor a scale of prices extending over some 500 per cent. It is no uncommon thing to find motors supplied at 1½d. per unit, when the nominal price is 7d. or 8d., and to such an extent is this carried that the actual receipts do not greatly exceed half the nominal charge. That is to say, the total number of units sent out, divided into the actual net receipts over the year, works out to about 4d. and not 8d. What would be the financial condition of a gas company having a nominal price of 5s. per 1.000 cubic feet, a scale of discounts extending to a net price of 1s. per 1,000 cubic feet. and an average receipt of 2s. 6d.? Gas engineers have been led to take an interest in the question of how far this line is legitimate and remunerative, by the fact that a very large business in fuel and power awaits any gas company that is inclined to adopt similar

tactics. It has been suggested that electricians are willing to do business at a loss as a means of getting a footing, but the parties chiefly concerned do not admit this argument, but assert that there is profit in the 1½d. rate. This naturally leads to the question of the lowest rate at which it would pay to run a big daylight line in coal gas. A further impetus has been given to the question by the threatened competition of blue gas at a trifle over nothing per 1,000 cubic feet. Gigantic schemes are on foot for manufacturing producer gas on the large scale and supplying it to manufacturers at as low as 2d. per 1,000 cubic feet. Such gas would only be equal to 130 B.T.U. per cubic foot, or about one-fifth the quality of coal gas, and would, therefore, be equivalent in price to coal gas at something under 1s. per 1,000 cubic feet. Whatever the course adopted may be, care should be taken to avoid inflating the capital account. In all concerns that are run upon cutting terms, it is necessary to look closely after the capital expenditure, because it is so easy to get rid of inconvenient items by putting them on to the permanent debt. The concern must show a profit if the confidence of the shareholders is to be maintained, and if there has been any sailing too close to the wind, resulting in an undue depletion of the balance available for dividend, the temptation to find plausible arguments in favor of transferring certain items to capital which do not usually find a resting place in that direction is very great. It may be taken as a safe guide both for individuals and companies that the bonded debt should be well within the actual value of the concern. The great drawback to municipal ownership or trading is the fatal facility with which debts can be incurred on behalf of town authorities, at the instance of parties who have not an intelligent grasp of the financial conditions involved. The extent of municipal indebtedness throughout the country has attracted the attention of more than one financier. The same thing applies to joint stock companies running any popular novelty. There is a tendency to bolster up the present at the expense of the future, and such a policy means a day of reckoning sooner or later, when the irresponsible promises as to the future must be realized in the form of tangible hard cash of the present, or else the undertaking must start on a down grade. In entering upon the question of cutting business it is well to remember that the policy is surrounded with special dangers and pitfalls, and that ingeniously constructed schemes on paper require careful verifying at every point in practice. I do not propose to enter upon any discussion as to the methods by which the lowest remunerative special prices can be arrived at—they are obvious to all careful students of gas finances.

One point is remarkable. It has frequently been remarked in discussions on this subject that differences of 10 or 20 per cent. would be noticed by and create dissatisfaction amongst the consumers. And as a matter of fact it is so, and such differences have been criticized in anything but a complimentary manner. With regard to electricity the point has not been raised, probably because the public generally do not understand the basis of electric bills. The 500 per cent. variation passes unheeded and no one asks why one party pays 1½d. for the same value that is charged to his neighbor at 7d. or 8d. Whether the public would as readily accept a similar erratic schedule as regards the scale of charges for gas after having been used to uniform rates since the memory of the oldest inhabitant is another thing.

A new feature in our technical press is the reports of the proceedings of our Junior Gas Associations, which are beginning to take up a position in connection with the gas industry, and I do not know if there is anything more than a coincidence in the fact that the London and Southern District, the Manchester and District, and the Yorkshire Junior Gas Associations have been holding meetings within a few days of each other. Of these the Manchester held their fourth and the London their second annual meeting, whilst the Yorkshire Association was the first or inaugural gathering. Whilst in the States the needs of the Juniors have been cared for by the provision of educational classes by correspondence, in England the Juniors have been left to take their own independent course, thus adding to the already somewhat bulky list of gas engineer's associations. The very length of that list is to some extent a confession of weakness, of divided counsels and interests. The work that is done by a score or so of different associations could be done more efficiently and at much less cost by one central body. Apart from other reasons, the mere fact of being always alive is a great help to effective work, and an association that was promoting a meeting for ordinary members one month, for students the next, and for associates the third, would put more life into all three, than could be done by separate associations, who pass 50 weeks out of the year in a state of hybernation. Our Institution of Gas Engineers is in active existence about the time of the annual meeting, but if evidence is wanting of the torpid condition between whiles, it is furnished by the "first they would and then they wouldn't" kind of way in which they have dealt with the proposition made by the Crystal Palace Company for an exhibition of gas appliances. The Juniors have waited a long while. There has been a great deal of talk about the educational work of the Institution but nothing has been done. And there are two ways in which to look at the establishment of the Junior Associations: As a healthy evidence of a desire to advance on the part of the members, and as a sign of weakness on the part of the so-called Senior Associations in leaving a desirable class out in the cold. There has been a considerable talk over the desirability of excluding traders from the membership rolls of the Institution, and some of the energy that has been directed to the question of who should or should not be excluded, might with great advantage have been directed to the subject of who should or should not be admitted. The question should be how to enlarge the entrance rather than how to diminish it, for no Association having a narrow entrance door can possibly be a success. As things are, the Juniors have done wisely in wasting no more time, but taking independent action.

Junior Associations are only possible in districts where the members are within hailing distance and can assemble at the meeting place at a small cost both of time and money. The Junior is not in a position to lose a day and incur hotel expenses in order to attend a meeting, but requires to be able to do the whole within half a day, from the time of leaving the works to the time of returning. He must, therefore, reside within 20 or 30 miles of the meeting place, and within reach of a good train service. Three-fourths of the Juniors in gas works are thus placed out of court. A Junior Association in the suthwest of England, for example, where the gas works average 20 miles apart, would not be practicable. But there are many large towns which would make up, within the prescribed radius, a membership sufficient to maintain a useful and capable Association. Some of our older Associations have not always been able to decide whether a meeting is intended for the conduct of plain, solid business, or whether it is a jollification of the beanfeast type. The Juniors will do well, for the credit of their Association, to meet this question plainly, and if they find that there is not sufficient matter on hand to fill the programme, to miss a date and to wait till the deficiency is quite covered, rather than to hold a meeting that is a meeting in name only. No doubt there is some good in "informal meetings" of gas managers. If such meetings run in the direction of picknicing, drinks and games of billiards, there may be no positive harm, but it is idle to pretend that there is any great benefit either in an intelligent or business sense. A day or two of change and congenial companionship is a benefit in its way, but it must not take the place of the solid work of an Association meeting.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Mr. George P. Dennis, writing from Ventura, Cal., under date of the 18th inst. says: "The Ventura Water, Light and Power Company has developed natural gas in quantities sufficient to supply the city with its supply on such account. In fact, it is quite certain that after Ventura's needs are met we will have something to spare for adjoining districts. A franchise has been granted, and some of the piping material has been ordered. Construction work will be commenced at once." The officers of the Company are: President, E. P. Foster; Vice-President, J. H. Adams; Secretary, George C. Power.

Occasionally we find something like this, which is rare in these times of "fault" with the people who supply gas: "A Mrs. Lapham, the proprietor of a private boarding house in St. Paul, Minn., finding that frost had reduced the gas pressure in the pipes supplying her house, gave notice of the fact to the Gas Company. A representative was sent to the house, who upon his arrival notified the landlady that it would be necessary to turn off the gas while making repairs. Mrs. Lapham, with the assistance of a boarder, attempted to turn off the gas jets throughout the house, but overlooked the room of one of the boarders. This boarder was at the time in her room, and had fallen asleep with the gas lighted. She was injured by inhaling the escaping gas when it was turned on again. The Supreme Court of Minnesota has held in an action for damages (Skoglund vs. St. Paul Gas Light Company, 93 Northwestern Reporter, 668), that the Gas Company was not guilty of negligence in failing to notify the sleeping boarder that the gas would be turned off, or in failing to see that all of the gas jets in the house were turned off when the gas was turned on again. The court said in part: 'It would be an unreasonable demand to require the Company to go through the house and look at each jet to see that it was properly

turned off, or to notify all the occupants to that effect. The landlady was the representative of the members of her household, and it was with her that the Company transacted its business.'"

THE Solano (Cal.) Electric Light and Gas Company has been purchased by a well-known California syndicate. It is understood that Mr. Peter Anderson will be retained as the local Superintendent; and we hope the rumor or understanding will prove true, for he has been always loyal to his employers and capable in his management of their affairs from a local point of view.

RECEIVER GEORGE W. PEPPER, of the Bay State Gas Company, of Delaware, seems determined to secure the plant of the New Castle (Del.) Gas Company as a gem in the assets of the first-named dying corporation. Mr. J. Edward Addicks, let us hope in the long run, will believe that Receiver Pepper has healthy condiment in his way of conducting affairs.

SUPERINTENDENT ABBOTT, of the Springfield (O.) Gas Company, is pretty well up to his full capacity in the matter of work just now, but he smiles a trifle over the fact that his main system plans of extension have been accepted and are to be carried out according to his ideas.

THE tar-reducing plant of the Milwaukee (Wis.) Gas Light Company will not be completed until next spring. Its planning is on a very extensive scale, and the Barret Manufacturing Company may have to put up prices shortly on the purchasing side.

A CORRESPONDENT in Harrisburg, Pa., writing under date of the 20th inst., says: "Judge Jacobs has handed down an opinion in the mandamus proceedings brought by the State against the Consumers Gas Company, of Scranton, Pa., in which he ordered judgment entered for the defendant. The proceedings were brought to determine whether the Consumers Gas Company had the exclusive right to make gas in the city of Scranton. The State claimed that the Hyde Park Gas Company had the exclusive right to furnish gas in the city of Scranton, even though the charter of the Consumers' Gas Company covered the whole county of Lackawanna. The State further claimed that, on its supposition that the Hyde Park Gas Company had the exclusive right to furnish gas to the city of Scranton, that the charter of the Consumers Company should be forfeited as it called for the right to furnish gas throughout the whole of Lackawanna county. The State also asked that, if the Consumers Company can exist as a corporation that it be denied the right to furnish gas in the city of Scranton. Judge Jacobs answers the claims of the Commonwealth by giving the following conclusions of law: 'That the Hyde Park Gas Company has no exclusive franchise in the city of Scranton; and, therefore, the charter of incorporation of the defendant Company is good and valid and judgment ought to be entered in favor of said Company. Even if such exclusive franchise exists in favor of the Hyde Park Gas Company, the territorial limits of the defendant Company being larger than the city of Scranton, the existence of such exclusive franchise is no ground for declaring the charter of incorporation of the defendant Company wholly invalid and ousting it from its corporate existence. The defendant Company, having exercised no franchise within the city of Scranton, this court has no jurisdiction to oust it from the franchises which it merely claims to possess, and has never exercised.'"

THE Willow Grove Gas and Lighting Company, with headquarters of some sort or another in Philadelphia, Pa., was chartered the 21st inst., at Harrisburg, Pa. Its initial capital is put at $5,000.

THE proprietors of the San Diego (Cal.) Gas and Electric Company have decided to reduce the selling rate to $1.50 per 1,000 cubic feet, the concession to date from January 1st.

IT is said that an increase of 20 per cent. in the selling rates has been made by the Macomb (Ills.) Gas Company.

A BY-LAW to raise $50,000 for the purchase of the Belleville (Ont.) gas works will be submitted to the voters of that city at the municipal election to be held next January.

THE plant and franchises of the Watkins (N. Y.) Consolidated Gas and Electric Light Company have gone into the control of Mr. Albert L. Sweeney, of this city. Mr. Sweeney will personally manage the business of the Company hereafter.

THE Chemung County Gas Company, of Elmira, N. Y., has established the following rules for house piping:

"The Company for the protection of its consumers will exact full compliance with the following rules governing the use of natural gas and the plumbing of buildings for the use of same: The Company will refuse to pass or turn gas into work which has been done in violation of these regulations. Have all chimneys and flues carefully cleaned before allowing products of consumed natural gas to pass into them. Do not attempt to use natural gas in open top stoves or ranges, nor any appliance not connected with a flue. Special appliances are necessary in every instance to the proper use and combustion of natural gas. It will, of course, burn in any burner or appliance, but economy and safety demand that natural gas be consumed in appliances especially adapted to the purpose. Under no circumstances should hose connections be used. Use nothing but all pipe connections.

"Do not attempt to economize in your house piping by having smaller sizes of pipe installed. The result to the consumer will be insufficient supply, which the Company cannot remedy.

"A consumer's gas bills are largely increased by friction loss in his house pipes. Have large sized pipe and as few elbows or bends as possible; your service will then be of the best and your bills correspondingly small. Natural gas has a very distinct odor; its presence, owing to leakage, may be readily detected. Unconsumed natural gas is not injurious to health and will not cause asphyxia under 3 or 4 hours. The by-products of consumed natural gas should not be permitted to escape into any room, as they at once condense, leaving a heavy moisture on the walls, etc. Have closed top stoves connected with a flue and the trouble is easily overcome.

"Obtain perfect combustion by burning gas in appliances designed especially for natural gas. Do not attempt to use artificial gas appliances for natural gas. The experiment will be costly and unsuccessful. Coal ranges may be adapted for natural gas by the installation of burners; several good makes are on the market. This method is about 15 per cent. more expensive than the natural gas range. Do not load a stove or furnace or grate with firebrick or other material; obtain a clear, blue, amber-tipped flame by the adjustment of your air mixers and allow it to play directly on some vertical surface calculated to radiate the heat and the best results are secured. Do not be afraid of natural gas—it is in use in 500,000 homes throughout the United States. Accidents are rare and are mainly due to carelessness. No cast iron fittings may be used. All **L**'s, **T**'s, unions, etc., must be galvanized. No cement other than a white lead, red lead or graphite preparation may be used. No lead connections may be used in any event. No stopcock, globe valve, union, or other fitting shall be placed behind partitions, under floors or in other places not easily accessible. Suspended pipe and pipe running vertically must be securely fastened with pipe fasteners or chain. No string, rope or wire will be passed. Each building must be supplied with a separate and individual service line from the street. Meters in every case must be placed directly over the service line where it enters the building; where it is impossible that meters should be so placed, they will be located by the Company's inspector. In piping flats or blocks where gas is to be used on the upper floors as separate from the ground floors, separate and individual risers must be constructed for each prospective consumer. No pipe will be permitted to run on the outside of any building. No bent pipe other than ordinary offsets will be passed. No traps or unnecessary bends or elbows will be permitted. All work must stand a test of 12 pounds mercury column for 20 minutes. No spring gauge tests will be passed. The Company may reject and refuse to pass any work which in general character gives evidence of faulty workmanship or careless construction. The following schedule of piping will be observed. Nothing less than 1 inch for main run will be passed.

1 stove or grate	¾-inch pipe.
2 stoves or grates	1 " "
3 " " "	1¼ " "
4 " " "	1½ " "
Furnaces require	2 " "

"Greater lengths than

15 feet of	¾	inch must not be used.					
20 " "	1	"	"	"	"	"	"
50 " "	1¼	"	"	"	"	"	"
100 " "	1½	"	"	"	"	"	"

THE AMERICAN GAS LIGHT JOURNAL

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NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, NOVEMBER 30, 1903.

The Market for Gas Securities.

The demand for city gas shares, in contradistinction to the rest of the general list on the Exchange, was rather better than for some time past, and while the "general list" showed marked declines, the shrinkage in gas share values was virtually nominal. Consolidated closed to-day (Friday) at 176¼ to 177½, which represents a decline of 1 point in the bid price; but the real feature of the situation seems to be that no short lines are being put out. In fact, some of the shorts now uncovered will have trouble shortly when the time for settling is at hand. Mutual is being inquired for, and so is Standard common.

Brooklyn Union is unchanged, save for the quotations, which show that bidders offer 5 points less for it than they did a week ago, whereas holders ask 5 points more. The fact is that no Brooklyn Union for actual transfer is on the market at less than 200. Peoples, of Chicago, is 94½, bid, and there is every outward indication that 100 will be about its figure before Christmas. Cincinnati Gas and Electric keeps improving, sales in it having been made last week at 97½, and Baltimore Consolidated is 60, bid, but we do not think any considerable block could be purchased under 62½. San Francisco Gas and Electric remains steady, despite the freely advertised purpose of certain Coast speculators to give to San Francisco another gas company "that will truly serve the public." Is it not time that the residents of San Francisco began to comprehend the real meaning of such bosh?

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

NOVEMBER 30.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	176½	177½
Central Union, Bonds, 5's.	3,000,000	1,000	104	106
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	118	120
Metropolitan	658,000	..	108	112
Mutual	3,500,000	100	260	300
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co..				
Bonds, 5's	11,000,000	1,000	103	105
Northern Union, Bonds, 5's.	1,250,000	1,000	105	106½
New York and East River				
Bonds 1st 5's	3,500,000	1,000	102	106
" 1st Con. 5's	1,500,000	..	109	111
Standard	5,000,000	100	135	140
Preferred	5,000,000	100	155	170
Bonds, 1st Mortgage, 5's	1,500,000	1,000	116	117
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	185	210
" " Bonds (5's)	15 000,000	1,000	119	119½
Bay State	50,000,000	50	⅛	¼
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works	450,000	100	28	30
" 1st Mtg. 5's	500,000	1,000	93	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	4	5
" " Bonds, 5's	5,250,000	1,000	73	76
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas & Elec. Co..	29,500,000	100	97¾	97¾
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	101	101½
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	88¾	89¼
Preferred	3,026,500	100	107½	109
Consumers, Jersey City Bonds	600,000	1,000	100	102
Consumers, Toronto	1,700,000	50	218	225
Consolidated, Baltimore	11,000,000	100	60	..
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	15	17
" Con. Mtg. 5's	860,000	1,000	86	90
Consolidated G. & E. Co.'s.				
Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co	4,825,500	50	87	95
" Prior Lien 5's	5,603,000	1,000	99½	100
Detroit Gas Co., 5's	382,000	1,000	77	79
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	245	265
Hudson County Gas Co., of New Jersey	10,530,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	50	65
" Bonds, 6's	2,650,000	..	103½	106½
Jackson Gas Co.	250,000	50	73	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	79	90
Preferred	2,530,000	100	89	..
Bonds	10,000,000	1,000	109½	110
Lafayette Gas Co., Ind.	1,000,000	100	.	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	136	140
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	107½	108½
" 6 per cent. scrip, due 1910	100,000	25	85	87
Montreal, Canada	2,000,000	100	218	184¾
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co.	6,000,000	..	56	58
Bonds, 6's	4,600,000	..	105	105¾
New Haven	1,000,000	25	260	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	94½	94⅝
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co..	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	15,800,000	100	67	67¼
St. Joseph Gas Co.				
" 1st Mtg. 5's	751,000	1,000	92	96½
St. Paul Gas Light Co	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	113½	115
General Mortgage, 5's	2,465,000	1,000	92	93
Syracuse, N. Y.	1,975,000	100	46	48
Bonds	2,047.000	1,000	94	96
Washington, D. C	2,600,000	20	285	295
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	.	..	..
Wilmington, Del	600,000	50	232	..

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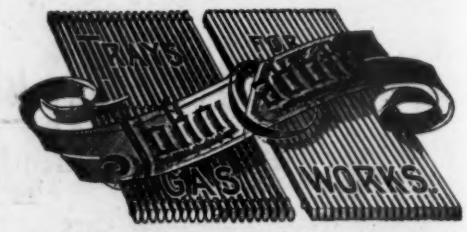

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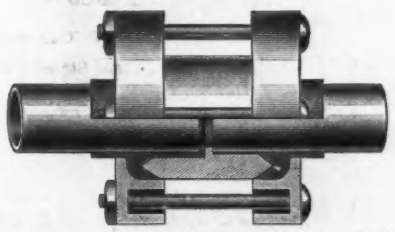
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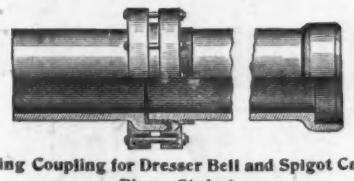
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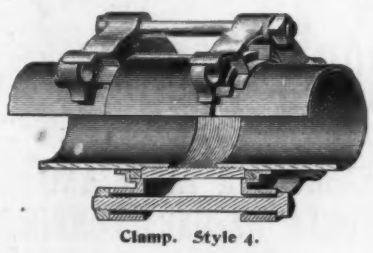
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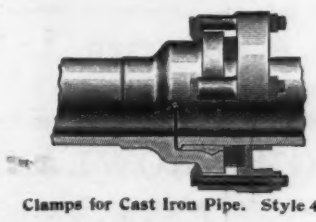
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Pipe Couplings, Sleeves, Clamps, Crosses, Tees and Ells.

My Insulating Coupling prevents the destruction of pipe by electrolytic action, in either water or gas lines.

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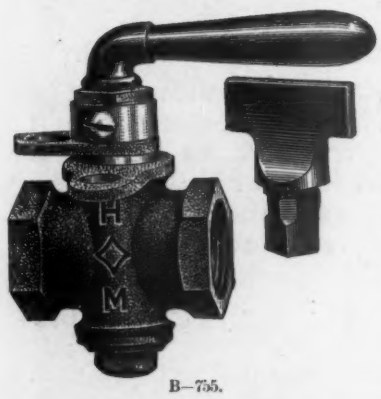
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TOO little is not as much as you pay for, and too much is more paid for than you need.

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Double and Single Gate Valves, ¼" to 72",
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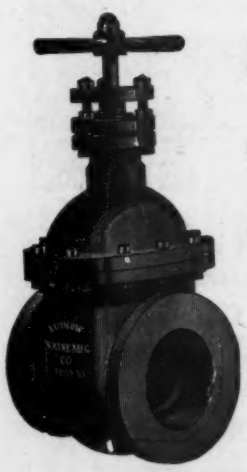

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Oxide, Coal and Coke Elevators and Machinery.
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BY UTILIZING A

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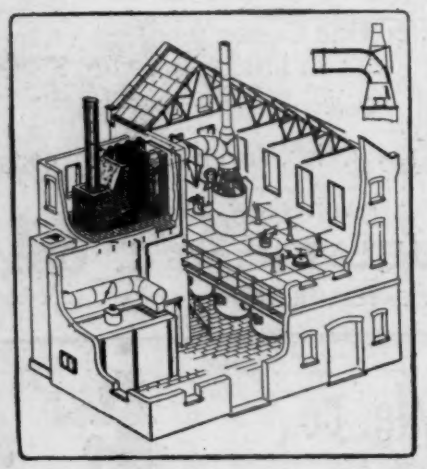

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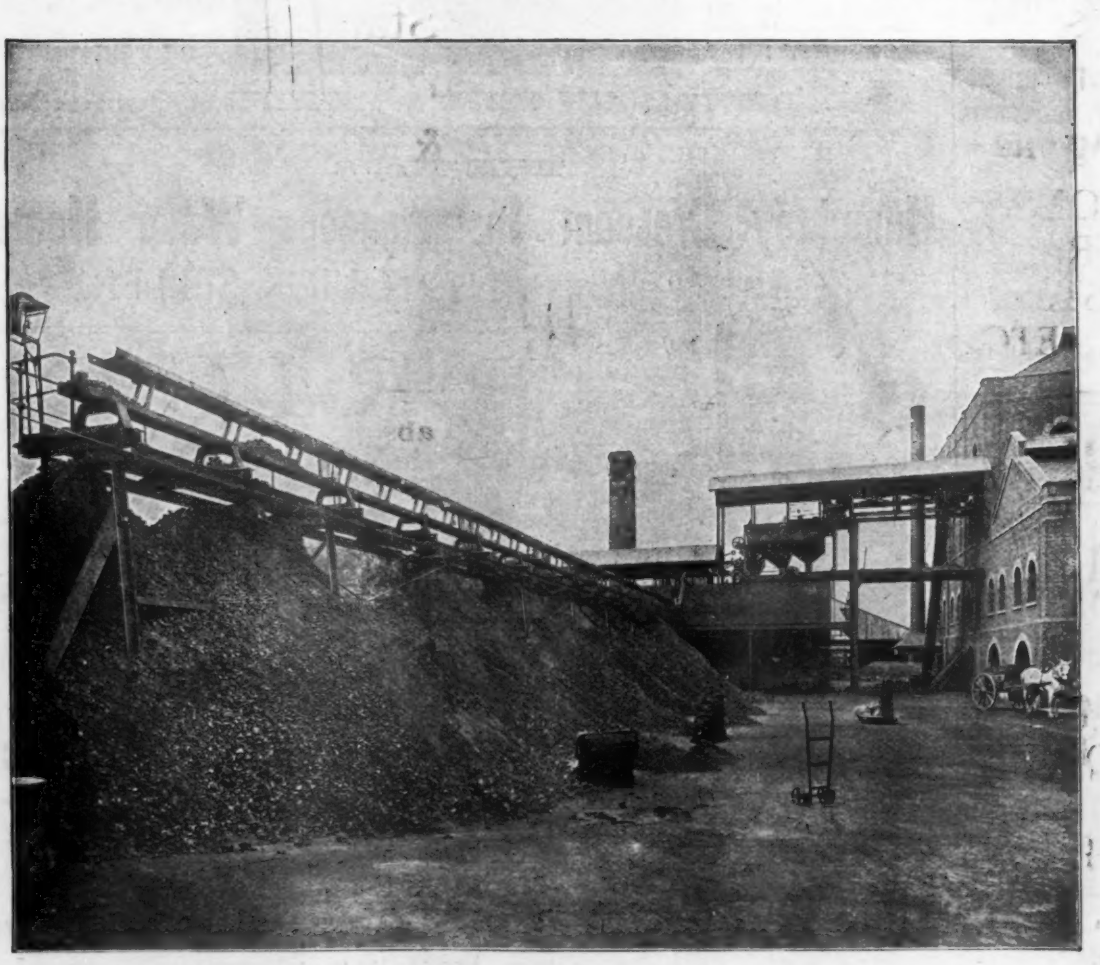

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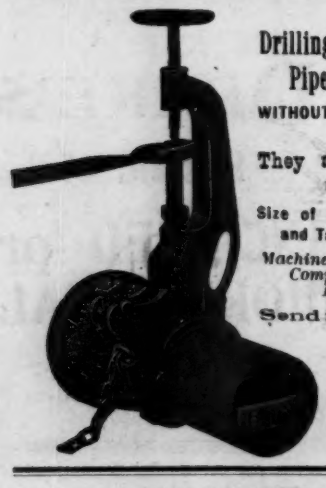

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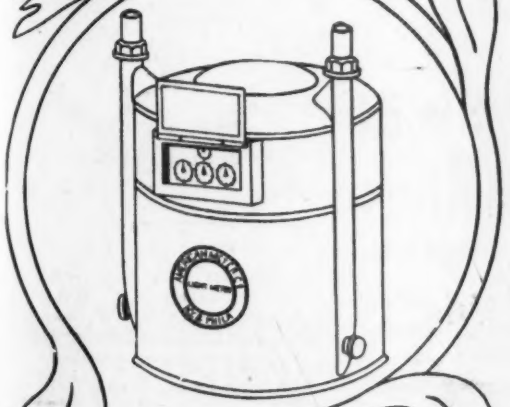
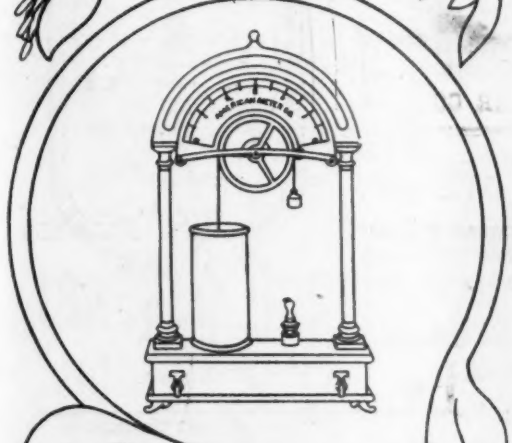
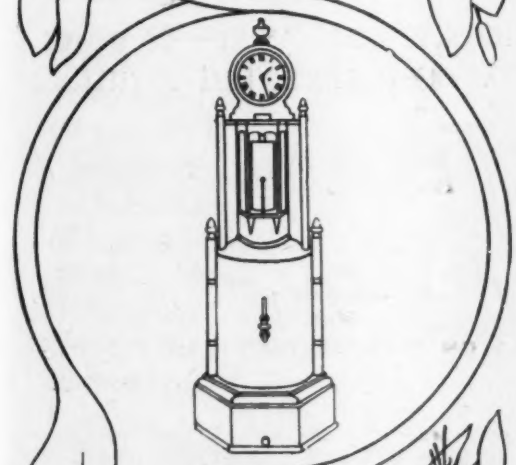
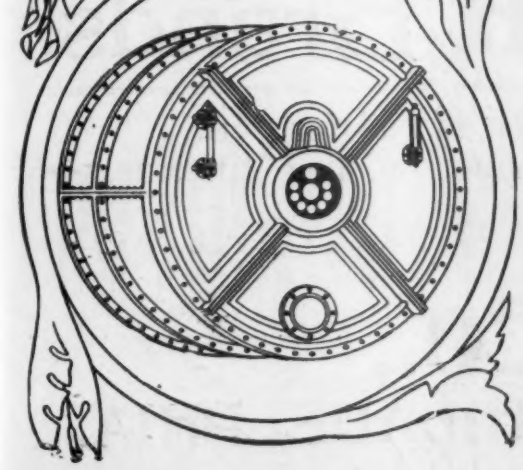
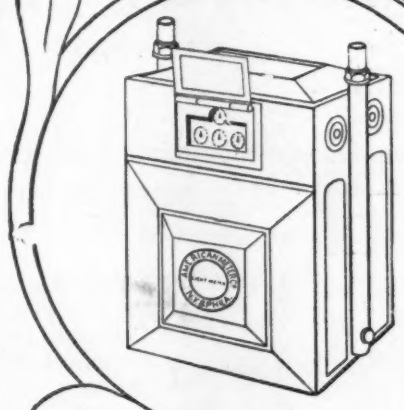
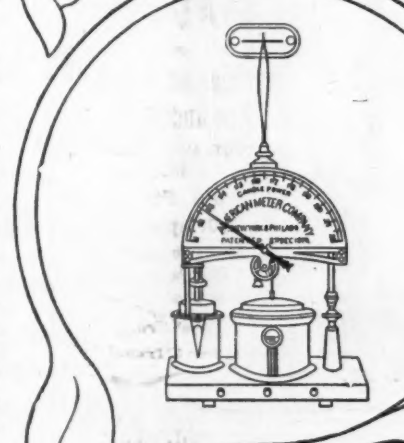


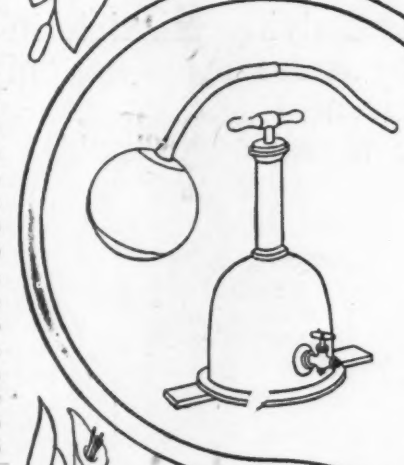


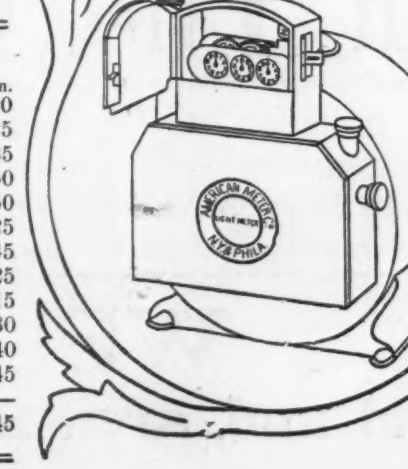












PUBLIC LIGHTING TABLE.

DECEMBER, 1903.

Day of Week.	Date	Table No. 1. Following the Moon. Light.	Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Extinguish.
				P.M.	A.M.
Tue.	1	3.30 AM	6.00 AM	4.20	6.10
Wed.	2	4.30	6.00	4.20	6.10
Thu.	3	No L.	No L.	4.20	6.15
Fri.	4	No L. FM	No L.	4.20	6.15
Sat.	5	No L.	No L.	4.20	6.15
Sun.	6	5.00 PM	8.00 PM	4.20	6.15
Mon.	7	5.00	9.00	4.20	6.15
Tue.	8	5.00	10.10	4.20	6.15
Wed.	9	5.00	11.20	4.20	6.15
Thu.	10	5.00 LQ	12.30 AM	4.20	6.20
Fri.	11	5.00	1.40	4.20	6.20
Sat.	12	5.00	2.40	4.20	6.20
Sun.	13	5.00	3.40	4.20	6.20
Mon.	14	5.00	4.50	4.20	6.20
Tue.	15	5.00	6.20	4.20	6.20
Wed.	16	5.00	6.20	4.20	6.20
Thu.	17	5.00	6.20	4.20	6.20
Fri.	18	5.00 NM	6.20	4.20	6.20
Sat.	19	5.00	6.20	4.20	6.20
Sun.	20	5.10	6.20	4.20	6.20
Mon.	21	5.10	6.20	4.20	6.20
Tue.	22	5.10	6.20	4.20	6.20
Wed.	23	8.20	6.20	4.20	6.20
Thu.	24	9.10	6.20	4.20	6.25
Fri.	25	10.10	6.20	4.20	6.25
Sat.	26	11.10 FQ	6.20	4.20	6.25
Sun.	27	12.10 AM	6.20	4.20	6.25
Mon.	28	1.10	6.20	4.20	6.25
Tue.	29	2.10	6.20	4.20	6.25
Wed.	30	3.10	6.20	4.20	6.25
Thu.	31	4.20	6.20	4.20	6.25

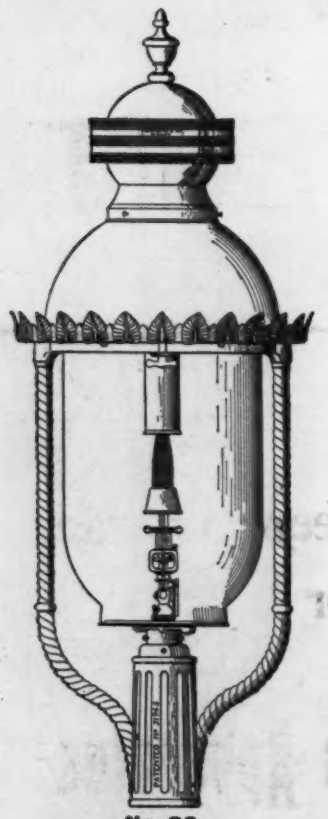
TOTAL HOURS LIGHTING DURING 1903.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January	245.00	January	423.20
February	192.00	February	355.25
March	201.00	March	355.35
April	167.20	April	298.50
May	152.00	May	264.50
June	131.00	June	234.25
July	140.40	July	243.45
August	156.20	August	280.25
September	171.20	September	321.15
October	198.20	October	374.30
November	216.30	November	401.40
December	232.10	December	433.45
Total, yr.	2203.40	Total, yr.	3987.45

NEW YORK, 33 Nassau Street. PHILADELPHIA, Broad and Arch Streets. CHICAGO, Foot of Orleans Street. BOSTON, 814 Beacon Building.
CLEVELAND, 809 Cuyahoga Building. ST. LOUIS, 712 Roe Building. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....



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POINTS OF MERIT:

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Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

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No. 38.

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THIS SHIELD IS THE WELSBACH TRADE MARK.

IT IS A GUARANTEE AND A PROTECTION.

Sell The Welsbach Brands.

The imitation stuff is bad for the customer---which is bad for you.

The genuine Welsbachs---Burners or Mantles---make satisfied customers---keep customers---MAKE NEW ONES.

And your profit isn't merely dollars and cents.

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Chicago, Ills.	**Lynn, Mass.**	**New York** (Central Union Co.)
Amesbury, Mass.	**Newark, N. J.**	**Cicero, Ills.**
Aberdeen, S. D.	**Washington, D. C.**	**Chicago** (Ogden Co.)
Winsted, Conn.	**Boone, Ia.**	**Easton, Pa.**
Canon City, Col.	**Pueblo, Col.**	**Lawrence, Mass.**
Schenectady, N. Y.	**Charlotte, N. C.**	**Council Bluffs, Ia.**
Hagerstown, Pa.	**Fall River, Mass.**	**Chattanooga, Tenn.**
Malden, Mass.	**Duluth, Minn.**	**Tuckerton, N. J.**
Bridgeport, Conn.	**New York** (Mutual Co.)	**Springfield, O.**
Albert Lea, Minn.	**Waltham, Mass.**	**Easton, Pa.** (2d contract).
Brooklyn, N. Y.	**Dover, Del.**	**Mobile, Ala.**

TOTAL DAILY SETS TO OCTOBER 15, 1903, ... 55
TOTAL DAILY CAPACITY, ... 56,600,000 cubic feet.
TOTAL SETS TO DATE, ... 502
TOTAL DAILY CAPACITY, ... 356,280,090 cubic feet.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
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Modern Recuperative Furnaces.

Standard Fire Brick and Gas Retorts.

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In Kegs, 100 to 200 " " 6 " "
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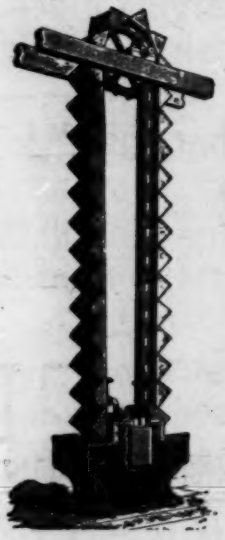

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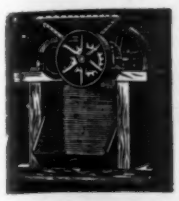

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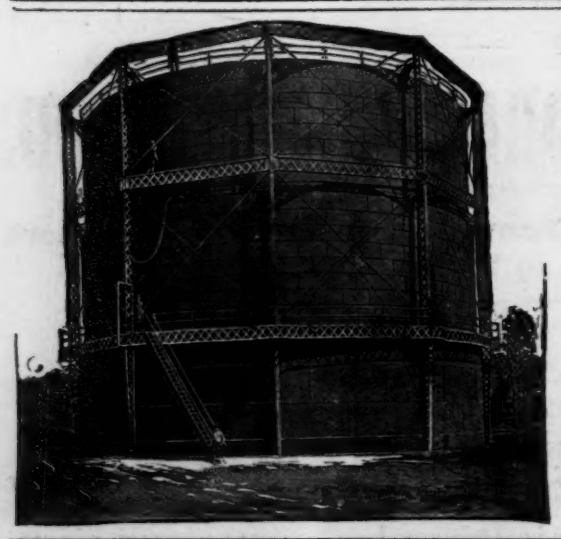

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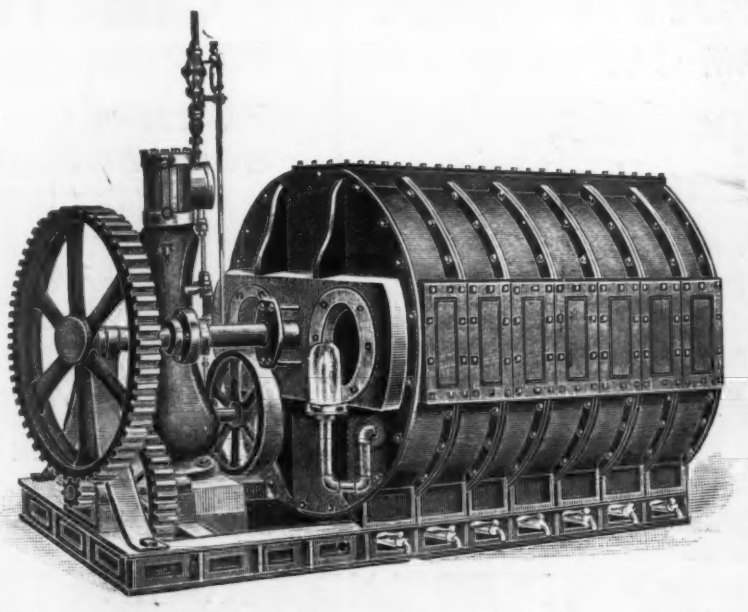

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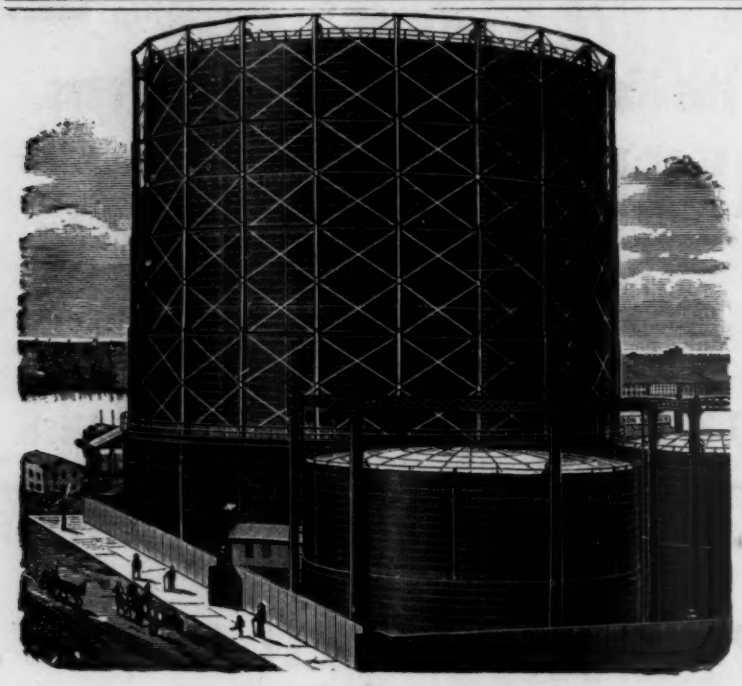

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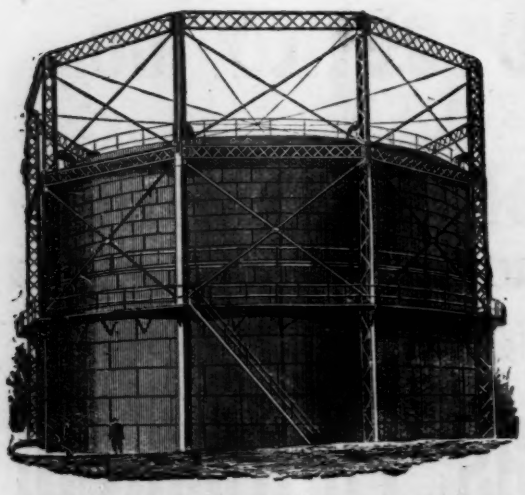

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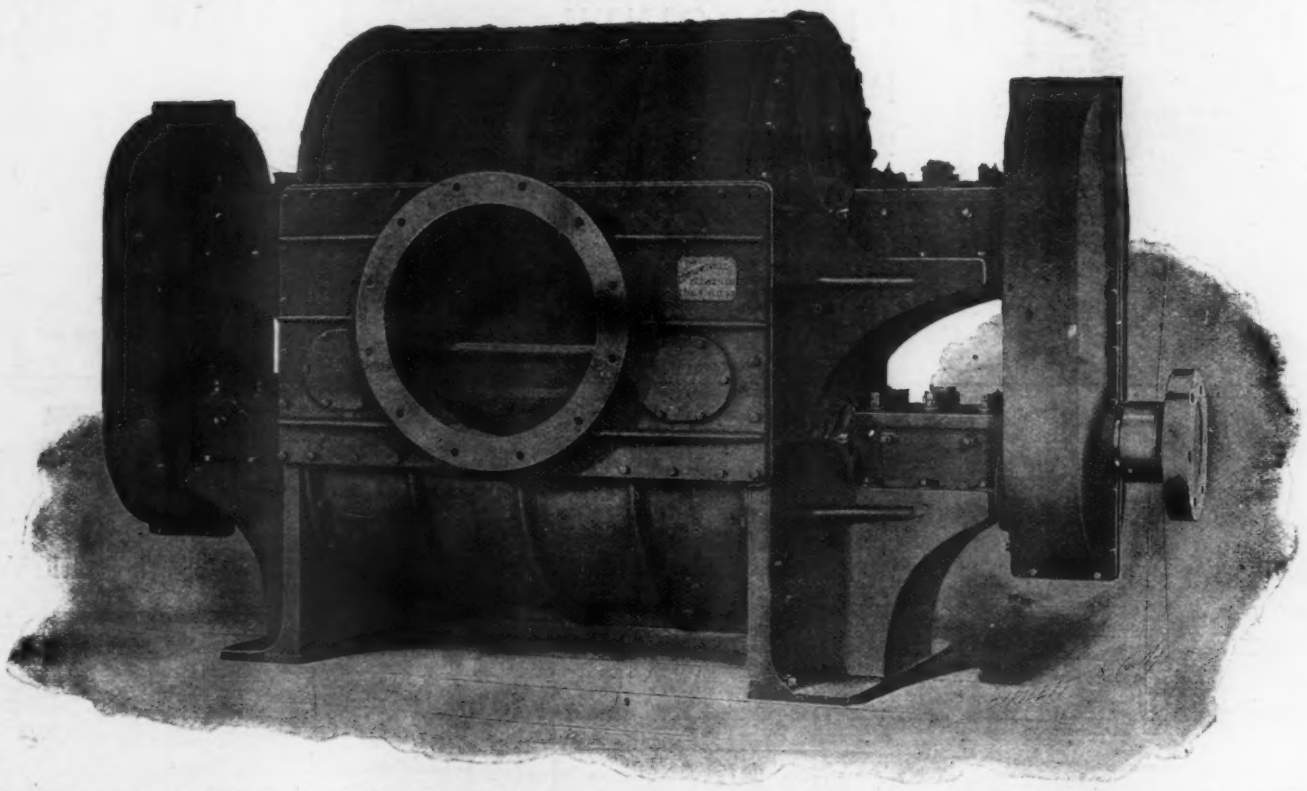

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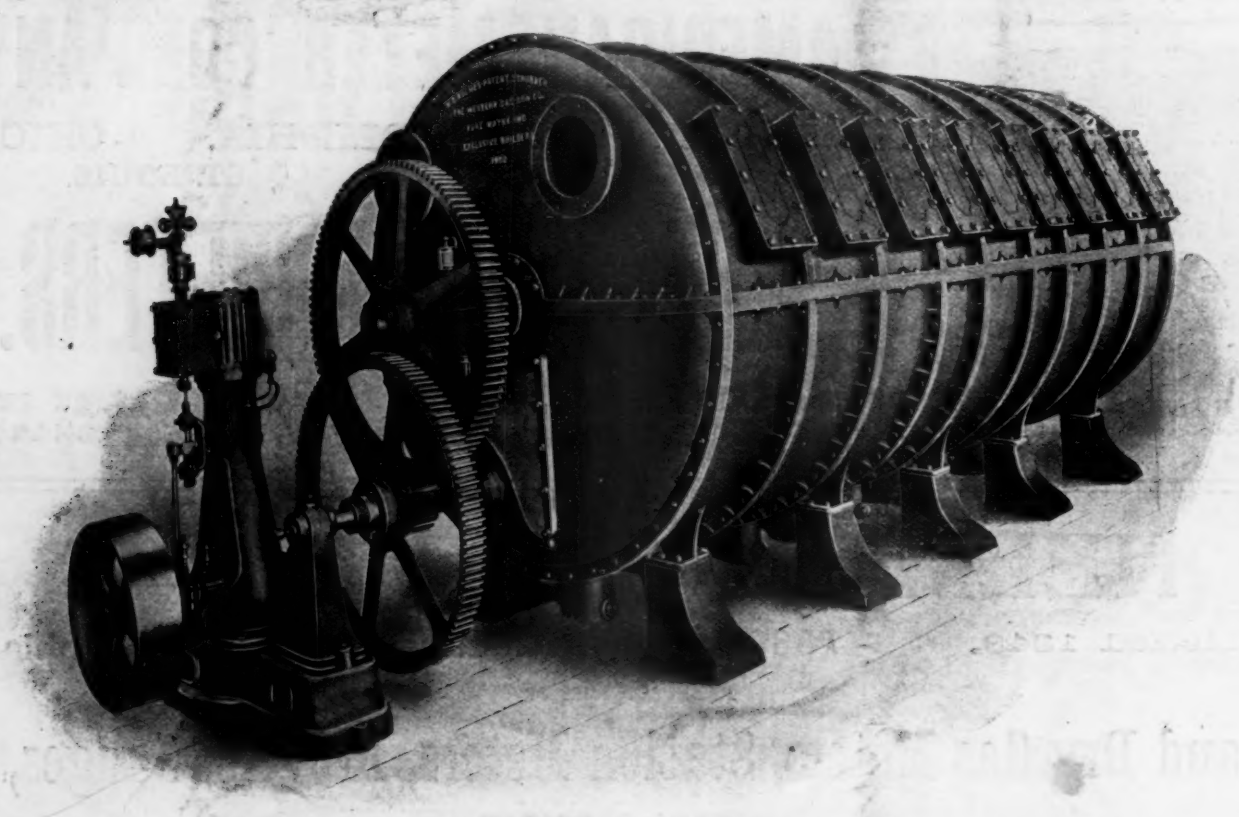

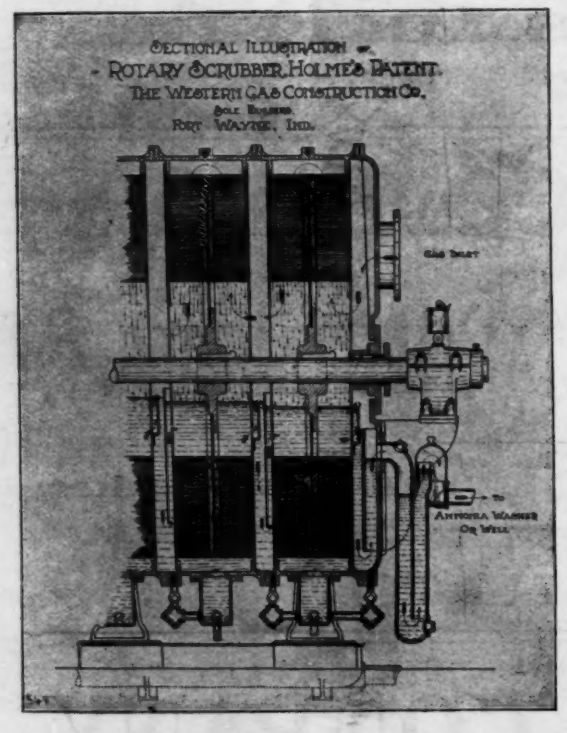

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